

Bulletin of
**Tennessee
Technological
University**

Undergraduate Catalog
2018-2019

INFORMATION DIRECTORY

All inquiries and correspondence concerning the following areas should be addressed to:

Admissions

Office of Admissions
Tennessee Technological University
Box 5006
Cookeville, TN 38505-0001
(931) 372-3888 or 1-800-255-8881
Fax (931) 372-6250
admissions@tntech.edu

Financial Aid

Office of Financial Aid
Tennessee Technological University
Box 5076
Cookeville, TN 38505-0001
(931) 372-3073 or 1-800-268-0236
Fax (931) 372-6309
financialaid@tntech.edu

Records and Registration

Office of Records and Registration
Tennessee Technological University
Box 5026
Cookeville, TN 38505-0001
(931) 372-3317 or 1-800-268-0242
Fax (931) 372-6111
records@tntech.edu

Residential Life

Office of Residential Life
Tennessee Technological University
Box 5016
Cookeville, TN 38505-0001
(931) 372-3414 or 1-800-268-0240
Fax (931) 372-3772
reslife@tntech.edu

Academic Offices

Provost and Vice-President for Academic Affairs	(931) 372-3224
College of Agriculture & Human Ecology	(931) 372-3149
College of Arts & Sciences	(931) 372-3118
Student Success Center	(931) 372-3610
College of Business	(931) 372-3372
Student Success Center	(931) 372-3371
College of Education	(931) 372-3124
Advising Center	(931) 372-6336
College of Engineering	(931) 372-3172
Student Success Center	(931) 372-3553
College of Fine Arts	(931) 372-3016
College of Interdisciplinary Studies	(931) 372-3366
Advising Center	(931) 372-6238
School of Whitson-Hester Nursing	(931) 372-3203
Extended Programs and Regional Development	(931) 372-3394
Graduate Studies	(931) 372-3233
International Education	(931) 372-3634

Directory assistance for other offices is available through the main switchboard at (931) 372-3101. The University's web site address is: www.tntech.edu.

Tennessee Technological University is a part of the State University and Community College System of Tennessee. TTU Does not discriminate on the basis of race, sex, sexual orientation, gender identity/expression, disability, age, status as a protected veteran, genetic information, or any other legally protected class. For inquiries regarding non-discrimination policies, contact equity@tntech.edu.

TTU /An EEO/AA/Title IX/Section 504/ADA Employer

NOTICE

The course offerings and requirements of the institution are continually under examination and revision. This catalog (bulletin) presents the offerings and requirements in effect at the time of publication, but is no guarantee that they will not be changed or revoked. However, adequate and reasonable notice will be given to students affected by any changes. This catalog (bulletin) is not intended to state contractual terms and does not constitute a contract between the student and the institution.

The institution reserves the right to make changes as required in course offerings, curricula, academic policies, and other rules and regulations affecting students to be effective whenever determined by the institution. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions. Current information may be obtained from the following sources:

Admission Requirements	- Admissions Office
Course Offerings	- Department or Division Offering Course
Degree Requirements	- Departmental Chairperson of Major
Fees and Tuition	- Business Office

The University provides the opportunity for students to increase their knowledge by providing programs of instruction in the various disciplines and programs through faculty who, in the opinion of the University, are qualified for teaching at the college level. The acquisition and retention of knowledge by any student is, however, contingent upon the student's desire and ability to learn and his or her application of appropriate study techniques to any course or program. Thus, the University must necessarily limit representation of student preparedness in any field of study to that competency demonstrated at that specific point in time at which appropriate academic measurements were taken to certify course or program completion. Any or all students may be required to take one or more tests designed to measure general education achievement and/or achievement in selected major areas as a prerequisite to graduation for the purpose of evaluation of academic programs. Unless otherwise provided for any individual program, no minimum score or level of achievement is required for graduation. Participation in testing and other evaluation measures are required for all students and for students in selected programs. In order to comply fully with this provision, the student must authorize the release of his or her scores to the institution. Individual student scores will be treated as confidential. As reported by the Tennessee Higher Education Commission, the graduation rate at Tennessee Technological University is 60%.

Tennessee Technological University is an Equal Opportunity/Affirmative Action institution and is in compliance with Titles VI and VII of the Civil Rights Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1974, the Rehabilitation Act of 1973, the Vietnam Era Veterans Readjustment Act of 1974, and the Americans With Disabilities Act of 1990. The University is nondiscriminatory on the basis of age, race, color, religion, sex, national origin, disability status, or status as a disabled veteran or veteran of the Vietnam era. Inquiries or complaints concerning these policies should be directed to the Director of Affirmative Action, Derryberry Hall, Room 156, (931) 372-3039.

Faculty members will endeavor to make necessary accommodations for disabled persons in their courses. The Office of Disability Services is available to assist the faculty to make necessary special arrangements for disabled students. This Office should be contacted as early as possible by a student regarding assistance that may be needed for attendance at the University.

ACADEMIC POLICY RELATIVE TO CLOSING DUE TO INCLEMENT WEATHER

GENERAL STATEMENT: Tennessee Technological University offices will remain open during periods of inclement weather, even though classes may be canceled.

In accordance with TBR policy, faculty, administrators, and staff of TTU are expected to make every reasonable effort to be at their work assignment on time, taking into consideration the personal risk involved. Administrators or staff employees who anticipate arriving late, or not arriving at work at all, should notify their immediate supervisor of this fact as soon as possible and request annual leave for the period of absence. If faculty members must be absent from assigned classes due to inclement weather, it is their responsibility to notify the appropriate chairperson and/or dean.

If classes are not canceled despite inclement weather, students are responsible for any academic work they miss as a result of inclement weather. It is the individual student's responsibility to take the initiative in making up any missed work, and it is the faculty member's responsibility to provide students a reasonable opportunity to make up missed work.



Dear Student,

Congratulations and welcome to Tennessee Tech. You will learn to be bold, fearless, and confident as you make the transformative journey through your college career. Here, you will be able to take your individual set of talents and goals and find out how Tech can best guide you as you create your individual success story.

Your journey will be tailored to you, and dedicated faculty, staff and administrators will support you. Plus, students and graduates often say they connected to a genuine student community.

No matter what you choose as a major and a career, our goal is for you to graduate with the ability to use technology to its fullest and to collaborate with people from other disciplines and diverse backgrounds. TTU is graduating students in record numbers as one of the most affordable, accessible institutions in the country producing career-ready graduates.

Your success is the focus of our Vision Statement:

Tennessee Tech will be nationally recognized as a leading technological university in the South, providing academic, economic and cultural leadership in the region and producing innovative, ready-to-work graduates from a broad range of academic disciplines prepared to excel in a technologically driven world.

We are ready to help you reach your goals and to have a memorable experience. I am glad you chose to become a Golden Eagle.

Sincerely,

A handwritten signature in black ink that reads "Philip B. Oldham". The signature is fluid and cursive, with the first name "Philip" being the most prominent.

Philip B. Oldham
President

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Tennessee Technological University**A State University**

Tennessee Technological University is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award baccalaureate, master's, specialist and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097 or call 404- 679-4500 for questions about the accreditation of Tennessee Technological University.

Accreditation

Association of Advance Collegiate Schools of Business
American Association of Family and Consumer Sciences
ABET
American Chemical Society
Accreditation Commission for Education in Nursing (ACEN)
Accreditation Council for Education in Nutrition and Dietetics
Council for the Accreditation of Educator Preparation
Commission on Collegiate Nursing Education
Council for Accreditation of Counseling and Related Educational Programs
Engineering Technology Accreditation Commission of ABET
National Association of Schools of Art and Design
National Association of Schools of Music
National League for Nursing Accreditation Commission

Memberships

American Association of Colleges of Nursing
American Association of Colleges of Teacher Education
American Association of State Colleges and Universities
Council of Graduate Schools
Higher Education Unit – American Association of Family & Consumer Sciences
National League for Nursing
North American Colleges and Teachers of Agriculture
Ohio Valley Conference
Oak Ridge Associated Universities
Cookeville Area – Putnam County Chamber of Commerce
Southern Association of Colleges and Schools
Southern Regional Education Board
Teacher Education Council of State Colleges and Universities
Tennessee College Association

University Calendar

This calendar is subject to change at any time prior to or during an academic term due to errors, emergencies, or causes beyond the reasonable control of the University.

Please see the University Calendar web site at www.tntech.edu/calendar for registration, fee payment, drop/add, and other important dates.

Summer Semester 2018

May 28.....	Memorial Day Holiday
June 4.....	Classes begin for First and Full Term
July 4.....	Independence Day Holiday
July 6.....	Final Examinations for First Term
July 9.....	Classes begin for Second Term
August 9-10.....	Final Examinations for Second and Full Term

Fall Semester 2018

August 27.....	Classes begin
September 3.....	Labor Day Holiday-No classes
October 15-16.....	Fall Break-No classes
November 21-23.....	Thanksgiving Holidays-No classes
December 7.....	Last day of classes
December 10-13.....	Final Examinations
December 15.....	Commencement

Spring Semester 2019

January 14.....	Martin Luther King Holiday-No classes
January 21.....	Classes begin
March 4-8.....	Spring Break
April 26.....	Last day of classes
April 29-May 2.....	Final Examinations
May 4.....	Commencement

Summer Semester 2019

May 27.....	Memorial Day Holiday
June 3.....	Classes begin for First and Full Term
July 4.....	Independence Day Holiday
July 5.....	Final Examinations for First Term
July 8.....	Classes begin for Second Term
August 8-9.....	Final Examinations for Second and Full Term

GENERAL INFORMATION

ESTABLISHMENT AND HISTORY

Tennessee Technological University was established by an act of the General Assembly in 1915 and opened its doors to students the following year. The University began operation on the campus which had belonged to Dixie College, a private institution founded in 1911. The purchase of the Dixie campus property and the erection of two dormitories, East and West Halls, were funded by Putnam County and the city of Cookeville. Since then, the growth of the institution has been closely interwoven with the development of the Upper Cumberland region.

From 1916 to 1924, Tennessee Polytechnic Institute offered work only on a high school and junior college level. By 1929, however, the Tennessee Board of Education had authorized a complete college program, and the first class of four-year graduates received their baccalaureate degrees in June.

In 1938 the instructional program was reorganized into two main divisions: the Arts and Sciences and the Professional and Technical Subjects. These divisions were renamed schools nine years later. In 1949, the administrative structure was expanded into five schools consisting of Arts and Sciences, Agriculture and Home Economics (now Agricultural and Human Sciences), Business Administration, Education, and Engineering. In 1950, the department of Military Science was added and in 1951 commissioned its first class of officers. The Graduate School program was authorized in 1958. The five undergraduate schools were designated as colleges in 1965, when Tennessee Polytechnic Institute gained university status and changed its name to Tennessee Technological University. In 1980, the School of Nursing began classes. In 2001, the School of Interdisciplinary Studies and Extended Education was established. In 2006, it was reorganized and renamed Extended Programs and Regional Development and the School of Interdisciplinary Studies and in 2012 school was changed to college. In 2006, the Schools of Agriculture, Human Ecology, and Nursing were incorporated into the College of Agricultural and Human Sciences. Effective July 2013 the name will change back to the College of Agriculture and Human Ecology and will include the School of Agriculture and Human Ecology. The school of nursing will be named the Whitson-Hester School of Nursing. Since 1972, the University has been governed by the Tennessee Board of Regents.

STATEMENT OF MISSION

Tennessee Technological University's mission as the state's only technological university is to provide leadership and outstanding programs in engineering, the sciences, and related areas that benefit the people of Tennessee and the nation. The University also provides strong programs in the arts and sciences, business, education, agriculture and human ecology, nursing, music, art and interdisciplinary studies. Tennessee Tech serves students from throughout the state, nation, and many other countries, but it retains a special commitment to enrich the lives of people and communities in the Upper Cumberland region of Tennessee.

The University is committed to the life-long success of students in its undergraduate, master's, specialist, and doctoral

degree granting programs through high-quality instruction and learning experiences. The University is engaged in scholarly activity, especially basic and applied research, creative endeavors, and public service, with special emphasis on community and economic development. The University supports student participation in a broad array of extracurricular activities as an integral component of its commitment to student life and success.

The University's three interdisciplinary Accomplished Centers of excellence in Energy Systems Research, Manufacturing, and Water Resources and Chairs of Excellence in Business Administration strengthen the instructional, research, and service mission of the University.

The University is as supportive of women as of men and as supportive of those in the minority as of those in the majority. The University provides educational opportunities to all eligible persons without regard to age, gender, ethnicity, race, religion, national origin, disability, or sexual orientation. The institution is committed to an inclusive and diverse campus that enriches the educational experience, promotes personal growth and a healthy society, prepares students for success in a global economy, and enhances America's economic competitiveness. Tennessee Tech Board of Trustees reviewed and affirmed the mission statement on June 15, 2017.

VISION STATEMENT

Tennessee Tech will be nationally recognized as a leading technological university in the South, providing academic, economic and cultural leadership in the region and producing practical, ready-to-work graduates from a broad range of academic disciplines prepared to excel in a technologically driven world. TTU will be one of the best universities in the nation through a commitment to the life-long success of our students.

THE UNIVERSITY CAMPUS

Location. Cookeville, Tennessee, the site of Tennessee Technological University, is located on Interstate 40, Highway 70 North, and Highway 111.

The city of Cookeville has a population of more than 26,000 and is located on the eastern Highland Rim of Tennessee at an elevation of 1,140 feet. The local public schools, civic clubs, and churches have a friendly and cooperative relationship with students, faculty, and staff. The surrounding area, enhanced by three major lakes, abounds in natural beauty and is served by several state parks.

Campus. The campus consists of a tract of 235 acres made attractive by shrubbery, native trees, and a system of driveways and walks; the buildings are arranged to make a compact and convenient university plan.

Gerald D. Coorts Memorial Arboretum. Established on the campus by the Cookeville Tree Board and the College of Agriculture and Human Ecology. This tribute to former Agriculture and Home Economics Dean Gerald Coorts was officially dedicated on March 7, 1997. This lovely "garden" includes more than 150 trees, shrubs, and flowering plants located in areas behind South, Jere Whitson and Kittrell Halls.

Residential Life. The Office of Residential Life realizes the impact that living arrangements can create on a student's life

and education. We feel the decision to live in University housing, while attending college, will provide additional opportunities; for personal growth, educational development, connectedness, and leadership experiences. Studies consistently show that students living in the residence halls have higher grade point averages and lower dropout rates and are involved in more campus activities than those living at home or off campus.

TTU campus has 15 residence halls, two for men, one for women and 12 coeducational halls accommodating approximately 2,300 students. Each residence hall is supported by an Assistant Coordinator, a live in professional staff member, a Hall Director, an experienced student staff member providing additional support to the hall, and between 9 and 12 Resident Assistants (RAs), upper class students hired to provide support, guidance and community development on each of the floors. Each residence hall is secured by entry through an electronic card access with only assigned residents and staff being allowed entrance. In addition to our residence hall space we also have 228 newly renovated apartments that are open to all full-time students. These apartments may be rented either individually or shared. The apartments are supported by a Residential Coordinator and 4 Resident Assistants. You may contact our office at 931-372-3548 or reslife@tntech.edu for additional information about housing at TTU.

Browning/Evins Halls	Men's Village – all male
Cooper/Dunn Halls	coed
Crawford Hall	Crawford Village – all female
Ellington/Warf Halls	Arts & Media Village -- coed
Maddux/McCord Halls	Engineering Village -- coed
MS Cooper/Pinkerton Halls	Global Village -- coed
Jobe Hall	Business Specialty Hall – coed Business and Honors will be combined in Jobe Hall for the fall 2015, due to hall renovations.
Murphy Hall	Honors Specialty Hall -- coed Business and Honors will be combined in Jobe Hall for the fall 2015, due to hall renovations.
New Hall North	The Tree House – Environmental Village -- coed
New Hall South	The Service Station – Service Village -- coed

Living-Learning Villages. The Village concept was conceived to create smaller, more personal groups within the larger university, to enhance student-faculty interaction beyond the classroom and to enhance positive student connections within the University. Each Village will be organized around a common theme and supported by a Faculty Head working together with the Assistant Coordinator, the Residential Life staff and the Village residents.

- The Tree House – Environmental Village, New Hall North, Established Fall 2010

- The Service Station – Service Village, New Hall South, Established Fall 2010,
- Women's Village – Crawford Hall, Established Fall 2011
- Engineering Village – Maddux McCord Hall, Established Fall 2011
- Art & Media Village – Ellington/Warf Hall, Established Fall 2012
- Global Village – MS Cooper/Pinkerton Hall, New Fall 2013
- Men's Village – Browning/Evins Hall, New Fall 2013
- Entrepreneurial Village – Jobe/Murphy, New TBA
- Health and Wellness – Cooper/Dunn, New TBA

New Hall North "Treehouse" Environmental Village. A beautiful co-ed facility, newly opened fall 2010 - housing 238 co-ed residents. New Hall North offers both double and single rooms with private baths. Additional amenities include: a great room for residents to gather on each floor, laundry rooms on each of the upper floors, as well as three study rooms centrally located within the hall. Also housed in New Hall North is the Environmental Village, including the Faculty Head office. As a part of the "Treehouse" there are a number of activities and programs scheduled throughout the academic year supporting environmental issues and additional opportunities for interaction and connection to the campus community.

Attached to New Hall North is the sorority wing; housing chapter rooms for four campus sororities, "The Perch" (pizza and grill) and convenience store, a recreation area - both located on the first floor, as well as a multipurpose/classroom located on the second floor.

New Hall North is available to all students with selected rooms held for new, incoming freshman residents.

New Hall South "The Service Station" Service Village. The companion to New Hall North, housing 358 co-ed residents, offers double rooms with private bathrooms. Additional amenities include: an atrium lounge that includes a large screen television and a ping pong table, four study rooms located throughout the hall as well as a multimedia classroom on the fourth floor. Also housed in New Hall South is the Service Village including the Faculty Head office. As a part of "The Service Station" there are a number of activities and programs scheduled throughout the academic year supporting service opportunities and additional chances for interaction and connection to the campus community. New Hall South is available to all students with selected rooms held for new, incoming freshman residents.

Maddux/McCord Hall Engineering Village. Maddux/McCord Hall is a traditional hall, housing 239 co-ed residents, that offers additional support for engineering students; 5 student engineering coordinators, hired especially to provide direct academic support for engineering students, as well as a computer lab specially equipped with engineering programs, as well as study lounges. Also housed in Maddux/McCord is the Faculty Head office for the Engineering Village. As a part of the Engineering Village there will be a number of activities and programs scheduled throughout the academic year geared towards students talking engineering classes.

Crawford Hall Women's Village. A traditional hall located just across from the Nursing & Health Services Building, housing 219 women residents. In addition to the normal traditional hall

amenities, also housed in Crawford Hall is the Faculty Head office, study rooms and a classroom for the Women's Village. As a part of the Women's Village program there will be a number of activities and events scheduled throughout the academic year selected to support women on a college campus.

Ellington/Warf Hall Arts & Media Village. Ellington/Warf is a traditional hall, housing 200 co-ed residents. This Village invites residents interested in visual, literary and performing arts including music, theater, film, and digital/online media and communication. Share your passion in one or more of these areas with fellow residents, even if you are majoring in something other than the arts or humanities. Located in the Arts & Media Village will be a "Village suite" located on the 1st floor of Warf Hall and will include; a classroom, study area, lounge and Faculty Head Office. **Ellington/Warf has completed a total renovation project. Re-opening for fall 2014 new amenities will including all new; furniture, HVAC, doors, flooring, paint, hallway carpet and updated lounge and bathrooms.**

MS Cooper/Pinkerton Hall Global Village. MS Cooper/Pinkerton is a traditional hall, housing 170 co-ed residents. The Global Village will cater to residents that wish to live in a global environment that includes students from all over the world. American and international students will be paired up to live together as roommates as well as having the opportunity to participate programs and activities designed to enhance this international environment. The Global Village will also be utilized as our break and summer hall, to accommodate residents that need a place to live over the university breaks. **MSC/P has completed a total renovation project. Re-opening for the fall 2013 new amenities will including all new; furniture, HVAC, doors, flooring, paint, hallway carpet and updated lounge & bathrooms.**

Browning/Evins Hall Men's Village – "The Cave". A traditional hall located just across from the STEM Center, housing 258 men. In addition to the normal traditional hall amenities, also housed in Browning/Evins Hall is the Faculty Head office, study rooms and a classroom for the Men's Village. As a part of the Men's Village program there will be a number of activities and events scheduled throughout the academic year geared to men on a college campus, all designed to enhance and encourage additional positive campus connections.

Specialty Housing. In addition to our Living Learning Villages we also have 2 specialty housing areas: Honors Program located in Murphy Hall. Jobe Hall provides support for business majors. In specialty housing, the Residential Life staff along with program mentors will provide opportunities for students to assist one another, both academically and personally. Activities include faculty involvement programs, study groups, technology resources and academic support programs. These specialty areas are anticipated to become the Entrepreneurial Village, TBA.

Jobe Hall will re-open the fall 2015 and Murphy Hall spring 2016; new amenities will including all new; furniture, HVAC, doors, flooring, paint, hallway carpet and updated lounge and bathrooms.

Tech Village. There are 228 newly renovated apartments may be rented individually or shared (married couples or same gender roommates). The apartments are rented on extended terms (August – December, January – May and June – July).

Additional benefits of Campus Living. Each residence hall and apartments may vary somewhat in the amenities offered, but they all include cable, local phone service, "free" laundry, and RESNET (internet service). All are tobacco free. To view the amenities chart or to apply for campus housing visit our web site at www.tntech.edu/reslife. The web site is full of information, including the campus housing handbook, Guide for Successful Living and a Frequently Asked Questions section. However, if you still find yourself in need of additional information, you can contact us at either reslife@tntech.edu or (931) 372-3548.

If you are interested in living in one of the Villages or any of the other halls, you may make your request on the housing application, on line at: www.tntech.edu/reslife/applications/.

Athletic Fields. Overall Field, home to the Tennessee Tech Golden Eagles Football team, is covered with artificial turf, and has an eight-lane artificial track. Tucker Stadium seats 16,500 spectators. The east stadium section houses facilities for the football team and instructional laboratories. The west stadium section contains classrooms, laboratories, rifle range, and offices for the Army R.O.T.C. program. Other fields include Quillen Field (the intercollegiate baseball field), the Ray Drost Intramural Fields, and lighted tennis courts.

Academic and Service Facilities. The following facilities serve either as academic buildings or as service buildings for the educational programs of the University:

Bartoo Hall houses a Learning Resources Center, Curriculum and Instruction Department, Educational Support Services, and computer labs.

Brown Hall houses the Departments of Electrical and Computer Engineering, Mechanical Engineering, and the Manufacturing Center.

Bruner Hall houses the Departments of Computer Science, Mathematics, and Physics.

Bryan Fine Arts Building houses the Departments of Music and Art and the James A. Wattenbarger Auditorium.

Clement Hall houses the Office of the Dean of the College of Engineering, the Basic Engineering Program, and the D.W. Mattson Computer Center.

Mattie Sue Cooper Residence Hall houses the Office of Residential Life as well as students assigned to the building.

Daniel and Matthews Halls house the Academic Development Program, Department of Sociology and Political Science, the Child Development Laboratory, the Special Education Program, Counseling and Psychology, and a number of model demonstration programs in education.

Derryberry Hall houses the central administration offices, Concert Hall (an auditorium with 828 seats), University Development, University Advancement, and Graduate School.

Joe L. Evins Appalachian Center for Craft located on Center Hill Lake near Smithville houses 87,000 sq. ft. of facilities including the Office of the Director of the Craft Center, classrooms, studios, a library, conference rooms, exhibition and sales galleries, a café, and residential quarters for 64 students.

Hooper Eblen Center houses the offices of the intercollegiate athletics program, the Eagle's Nest (an alumni-sponsored lounge and meeting room), and the center for varsity basketball games, convocations, concerts, and conferences. The seating capacity of this facility is 10,200.

Hyder-Burks Agricultural Pavilion is utilized during the week to support instruction in the School of Agriculture and is located at Shipley Farm. Phase I has over 4,000 sq. ft. for animal

holding facilities and a sales/demonstration arena. Phase II has a standard show arena and seating for over 2,000. It has office space, classrooms, and laboratory facilities.

The W. Clyde and Marie Hyder Farm contains thirty-one acres and is used as grazing acreage by livestock herds. The farm is operated by the School of Agriculture.

Foster Hall houses the Department of Chemistry.

Foundation Hall houses University Police.

Foundry Building houses Industrial Technology metal casting.

Henderson Hall houses the Office of the Dean of the College of Arts and Sciences, the College of Arts and Sciences Student Success Center (GECU), the Departments of English, Communication and History, the College of Interdisciplinary Studies, and Extended Programs and Regional Development.

Indoor Tennis Building houses two tennis courts.

Jere Whitson Building house the Admissions Office, Financial Aid Office, Records Office, Registration and Veterans Affairs.

Johnson Hall houses the Office of the Dean of the College of Business, the Departments of Accounting; Decision Sciences and Management; Economics, Finance, and Marketing, the MBA program, two computing and technology resource centers, all multimedia classrooms, and an auditorium with 150 seats.

Kittrell Hall houses the Department of Earth Sciences.

Lewis Hall houses the offices and instructional laboratories for the Department of Manufacturing and Engineering Technology.

Angelo and Jennette Volpe Library and Media Center houses the print and multimedia collections. The Library is a selective U.S. Federal Depository. Access to the Library's holdings is provided by an online catalog accessible through the campus network. The Library provides information sources in a variety of electronic formats. The Library participates in regional and national bibliographic networks which provide extensive resource sharing capability. The collections are now over two million titles.

Memorial Health and Physical Education Building houses offices, classrooms, apparatus rooms, handball courts, swimming pool, and two intramural gymnasiums. A large gymnasium which has a seating capacity of 3,262 is also located in this building.

Old Infirmary Building houses Military Science.

Old Maintenance Building houses the Agricultural Engineering Technology Laboratory and College of Engineering Research Laboratories.

Nursing and Health Services Building houses the offices, classrooms, and clinical simulation laboratories for the School of Nursing.

Pennebaker Hall houses the Biology Department, Cooperative Fisheries Unit, Women's Center, and Art Education.

Facilities and Business Services Buildings house offices, shops, and storage space for operation and maintenance of the University's physical plant.

Ray Morris Hall houses the Millard Oakley STEM Center for the Teaching and Learning of Science, Technology, Engineering and Mathematics. The Oakley STEM Center includes administrative offices and interview rooms, learning studios and prep lab, 240-seat auditorium, virtual theatre, food service, and multipurpose lobby space.

Prescott Hall houses the Departments of Civil and Environmental and Chemical Engineering; the Water Resources Center; and the Energy Systems Research Center. Also located in the building is an auditorium with a seating capacity of 401.

Recreation and Fitness Center is a facility of approximately 80,000 square feet which houses spaces for physical activity and recreation, including a natatorium. The construction and operation costs for this facility are funded entirely by student fees.

The Shipley Farm, which serves as a farm laboratory, contains three hundred acres and is located two miles from the main campus. It is used for demonstration, instruction, and research, and is operated by the College of Agricultural and Human Ecology Programs.

South Hall houses the School of Agriculture, and the School of Human Ecology, including the School's Historical Textiles Collection and Friday Cafe. In addition, it houses the Department of Foreign Languages.

T. J. Farr Education Building houses the Office of the Dean, Associate Dean, Assistant Dean and the Advisement Center of the College of Education, the Rural Education Research and Services Consortium, the Office of the Ph.D. in Exceptional Learning, and Offices of the Honors Program.

Roaden University Center Building houses the central dining rooms including a cafeteria and a grill; Post Office; Bookstore; Mini-Market; student and faculty conference rooms; Joan Derryberry Art Gallery; Student Government Association Offices; student publication offices; Communication and Marketing Office for news, publications, and sports information; Career Development Counseling Center; WTTU-FM; offices and conference rooms for student personnel services; Office of Financial Aid; Office of Student Activities and Campus Life; Office of Student Affairs; Dean of Students Office, Office of Disability Services, Office of Minority Affairs and Orientation and Student Success Office.

University Services Building houses the Heating Plant, Printing Shop and Telecommunications.

Walton House. The president's residence is located near Old Walton Road and historic Dixie Avenue. The Old Walton Road is a part of the route traveled between Washington, D.C., and The Hermitage by the Seventh President of the United States, Andrew Jackson.

BOARD OF TRUSTEES

PRESIDENT

Internal
Audit

Chief
of Staff

Government
Affairs

Intercollegiate
Athletics

University
Counsel

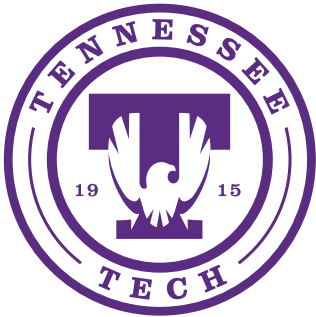
Board Secretary

Faculty
Senate

Staff Advisory
Committee

University
Assembly

- Academic Council
 - University Standing Committees
- Administrative Council
 - University Standing Committees
- Information Technology Committee
- International Affairs Committee
- University Planning Committee



COMMUNICATION
& MARKETING

- Communications & Marketing
 - Creative Services
 - Marketing
 - Printing Services
 - Web & Digital Media
- Public Relations
 - News & Communications
 - Media Production Center

ENROLLMENT MANAGEMENT
& CAREER PLACEMENT

- Career Development
- Financial Aid
- International Education
- Military & Veterans Affairs
- New Student & Family Programs
- Recruitment
 - Admissions
 - Scholarships
- Registrar
- Student Success
 - Academic Services
 - Advisement Services

PLANNING
& FINANCE

- Information Technology Services
 - Academic & Client Technologies
 - Systems Integration & Architecture
 - Service Center
 - Client Technologies Analysts
- Enterprise Application Systems
- Information Security
- Networking & Operations
- Site Licenses/Contracts
- Systems Support

RESEARCH & ECONOMIC
DEVELOPMENT

- Economic Development
- Millard Oakley STEM Center
- Sponsored Research
- Water Resources Center

STUDENT
AFFAIRS

- Access & Diversity
 - Diversity Scholarship Program
 - Ethics & Diversity
 - Multicultural Affairs
- Counseling Center
- Dean of Students
 - Judicial Affairs
 - RUC Services
- Student Activities & Campus Life
- Disability Services
- Eagle Card System
 - University Service Center
- J.J. Oakley Health Services
- Student Development
 - Residential Life
- University Police
- University Recreation & Fitness Center
 - Intramurals

UNIVERSITY
ADVANCEMENT

- Advancement Services
 - Financial
 - Gift & Pledge
 - Information
 - Records & Research
 - Stewardship
- Corporate & Foundation Relations
- Crawford Alumni Center
 - Alumni Engagement
 - Annual Giving
- Major Gifts
- Planned Gifts

ACADEMIC AFFAIRS

Academic
Support

- Joe L. Evans Appalachian Center for Craft (Administrative)
- Rural Development Institute

Accreditation, Assessment
& Faculty Development

- Accreditation
- Assessment
- Center for Innovation in Teaching & Learning
- Faculty Development
- Quality Assurance Funding
- Quality Enhancement Program
- Undergraduate Research and Creative Activity

Angelo & Jennette
Volpe Library

- Library & Learning Assistance
 - Learning Support

Digital & Distance
Education

- Extended Programs
 - Distance Learning
 - Non-Credit Programs
 - Special Events & Projects
- Off-Campus Programs
- TNeCampus

Institutional
Research

Military
Science

Special
Programs

- UNIV 1020
- Women's Center

College of Agriculture
& Human Ecology

- School of Agriculture
- School of Human Ecology
- Student Success Center

College of
Arts & Sciences

- Biology
 - Co-op Fisheries Unit
- Chemistry
- Communication
 - Oracle/WTTU
- Earth Sciences
- English
- Foreign Languages
- History
- Mathematics
- Physics
- Sociology & Political Science
- Student Success Center

College of
Business

- Accounting & Business Law
- Decision Sciences & Management
- Economics, Finance & Marketing
- Graduate Office
- iCube
- Small Business Development Center
- Student Success Center

College of
Education

- Counseling & Psychology
- Curriculum & Instruction
- Exercise Science, Physical Education & Wellness
- Student Success Center
- Teacher Education

College of
Engineering

- General & Basic Engineering
- Chemical Engineering
- Civil & Environmental Engineering
- Computer Science
- Cybersecurity Education, Research and Outreach Center
- Electrical & Computer Engineering
- Energy Systems Research Center
- Manufacturing & Engineering Technology
- Manufacturing Research Center
- Mechanical Engineering
- Minority Engineering Programs
- Student Success Center

College of
Fine Arts

- School of Art, Craft & Design
 - Joe L. Evans Appalachian Center for Craft (Academic Programs)
- School of Music

College of
Graduate Studies

College of
Interdisciplinary Studies

- Learning Villages
- School of Environmental Studies
- School of Interdisciplinary Studies
- School of Professional Studies
- Student Success Center

Honors College

Whitson-Hester
School of Nursing

ACADEMIC ORGANIZATION AND PROGRAMS OF STUDY

College of Agriculture & Human Ecology

School of Agriculture

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
Agriculture	Agriculture	<ol style="list-style-type: none"> 1. Agribusiness Management 2. Agricultural Communications 3. Agricultural Education 4. Agricultural Engineering Technology 5. Agricultural Science and Management 6. Agritourism 7. Agronomy & Soils 8. Animal & Pre-Veterinary Science <ol style="list-style-type: none"> a. Animal Science b. Pre-Veterinary Science 9. Environmental Agriscience 10. Horticulture 11. Nursery & Landscape Management 12. Turfgrass Management 	Bachelor of Science in Agriculture

School of Human Ecology

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
Human Ecology	Human Ecology	<ol style="list-style-type: none"> 1. Child Development & Family Relations (Non-Licensure) 2. Child Life 3. Family & Consumer Sciences Education 4. Food Systems Administration 5. Housing & Design 6. Merchandising & Design 7. Nutrition & Dietetics 	Bachelor of Science in Human Ecology

College of Arts and Sciences

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
Biology	Biology	<ol style="list-style-type: none"> 1. Biology 2. Cellular & Molecular Biology 3. Environmental Biology 4. Health Sciences 	Bachelor of Science
	Wildlife & Fisheries Science	<ol style="list-style-type: none"> 1. Conservation Biology 2. Fisheries Science 3. Wildlife Science 	Bachelor of Science
Chemistry	Chemistry	<ol style="list-style-type: none"> 1. Applied Chemistry <ol style="list-style-type: none"> a. Business Chemistry b. Environmental Chemistry c. Forensic Chemistry 	Bachelor of Science

		d. Health Sciences e. Industrial Chemistry f. Chemistry 2. Biochemistry 3. Pure Chemistry	
Communication	Communication	1. Communication Studies 2. Journalism a. News Editorial b. Public Relations	Bachelor of Science
Earth Sciences	Geosciences	1. Environmental Geology 2. Geographic Information Systems 3. Geography 4. Geology	Bachelor of Science
English	English	1. Creative Writing 2. Language and Rhetoric 3. Literature 4. Professional and Technical Communication 5. Theatre a. Performance b. Technical	Bachelor of Arts
Foreign Languages	Foreign Language	1. French 2. German 3. Spanish	Bachelor of Arts
History	History		Bachelor of Arts Bachelor of Science
Mathematics	Mathematics		Bachelor of Science
Physics	Physics	1. Traditional Physics 2. Applied Physics	Bachelor of Science
Sociology & Political Science	Political Science	1. Political Science 2. Legal Studies	Bachelor of Science
	Sociology	1. Sociology 2. Criminal Justice 3. Social Work	Bachelor of Science
*	International Business & Cultures		Bachelor of Science

*Administered by the College of Arts and Sciences and the College of Business

College of Business

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
Accounting	Accounting		Bachelor of Science in Business Administration
Decision Sciences & Management	Business Management	<ol style="list-style-type: none"> 1. Business & Information Technology 2. Business Intelligence & Analytics 3. General Management 4. Human Resource Management 5. Production & Operations Management 	Bachelor of Science in Business Administration
Economics, Finance & Marketing	Economics Finance Marketing		Bachelor of Science in Business Administration
	International Business and Cultures		Bachelor of Science

College of Education

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
Counseling & Psychology	Psychology		Bachelor of Science
Curriculum & Instruction	Early Childhood Education	<ol style="list-style-type: none"> 1. Early Childhood/Special Education 2. Early Childhood Education (Non-Licensure) 	Bachelor of Science
	Elementary Education		Bachelor of Science
	Multidisciplinary Studies	<ol style="list-style-type: none"> 1. English as a Second Language (PreK-12) 2. General (Non-Licensure) 3. Middle School English (6-8) 4. Middle School Math (6-8) 5. Middle School Science (6-8) 6. Middle School Social Studies (6-8) 	Bachelor of Science

Secondary Education		<ol style="list-style-type: none"> 1. English 2. French 3. German 4. Mathematics 5. (Non-Licensure) 6. Science <ol style="list-style-type: none"> a. Biology b. Chemistry c. Earth Science d. Physics 7. Social Studies <ol style="list-style-type: none"> a. Economics b. Geography c. History d. Political Science 8. Spanish 9. Speech Communication & Theatre 10. Special Program: (Not Requiring Degree) Occupational Education 	Bachelor of Science in Education
Special Education		<ol style="list-style-type: none"> 1. Comprehensive (K-12 2. Non-Licensure 3. SE Interventionist Biology (6-12) 4. SE Interventionist English (6-12) 5. SE Interventionist (K-8) 6. SE Interventionist Math (6-12) 7. SE Interventionist Social Studies/History (6-12) 	Bachelor of Science
Exercise Science, Physical Education and Wellness	Exercise Science, Physical Education and Wellness	<ol style="list-style-type: none"> 1. Fitness and Wellness 2. Licensure (K-12) 3. Pre-Athletic Training 4. Pre-Occupational Therapy 5. Pre-Physical Therapy 6. Pre-Physician Assistant 7. Recreation and Leisure 8. Sport Administration 	Bachelor of Science
Agriculture	Agriculture	Agricultural Education	Bachelor of Science in Agriculture
Human Ecology	Human Ecology	<ol style="list-style-type: none"> 1. Family & Consumer Sciences Education <ol style="list-style-type: none"> a. Child Care Services b. Food Services c. Fashion & Fabric Services 	Bachelor of Science in Human Ecology

College of Engineering

Undergraduate Degree Programs

Department	Major	Options Within Major	Degree
General and Basic Engineering	Basic Engineering		

	Engineering			Bachelor of Science in Engineering
Chemical Engineering	Chemical Engineering	1. No Concentration 2. Bio-Molecular Engineering Concentration		Bachelor of Science in Chemical Engineering
Civil & Environmental Engineering	Civil Engineering			Bachelor of Science in Civil Engineering
Computer Science	Computer Science	1. Cyber-Security 2. Data Science 3. High Performance Computing 4. Software & Scientific Applications		Bachelor of Science
Electrical & Computer Engineering	Computer Engineering			Bachelor of Science in Computer Engineering
	Electrical Engineering	1. No Concentration 2. Mechatronics		Bachelor of Science in Electrical Engineering
Mechanical Engineering	Mechanical Engineering	1. No Concentration 2. Mechatronics		Bachelor of Science in Mechanical Engineering
Manufacturing & Engineering Technology	Engineering Technology			Bachelor of Science in Engineering Technology

College of Fine Art

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
School of Art, Craft and Design	Fine Arts	1. Art Education 2. Clay 3. Design, Digital Media Emphasis 4. Fibers 5. Glass 6. Metals 7. Painting 8. Wood	Bachelor of Fine Arts
Music	Music	1. Instrumental Music Education Licensure 2. Vocal/General Music Education Licensure 3. Music Performance <ul style="list-style-type: none"> a. Composition Emphasis b. Instrumental Option c. Jazz Option d. Music Business Option e. Piano Option f. Vocal Option	Bachelor of Music

College of Interdisciplinary Studies

Undergraduate Degree Programs

Department	Major	Concentrations Within Major	Degree
Environmental Studies	Environmental and Sustainability Studies	1. Environmental Science a. Biology option b. Chemistry option c. Natural Resources option 2. Environmental Technology 3. Society, Culture and Communication	Bachelor of Science
Interdisciplinary Studies	Interdisciplinary Studies		Bachelor of Science
Professional Studies	Professional Studies	1. Health Administration 2. Information Technology 3. International Organizational Leadership 4. Organizational Leadership	Bachelor of Science

School of Nursing

Undergraduate Degree Program

Department	Major	Options Within Major	Degree
Nursing	Nursing		Bachelor of Science in Nursing

PRE-PROFESSIONAL PROGRAMS

Pre-professional programs are designed to satisfy minimum requirements for admission to professional schools. Some students complete only these minimum course requirements prior to seeking admission to the professional school; some students enroll in degree programs such as agriculture, biology, chemistry, engineering, physics, or others, and also take courses to complete the minimum professional school requirements because many of the courses satisfy requirements in both programs. In the case of pre-law, there is no specific degree required; therefore, students interested in law usually pursue a bachelor's degree in a field of their interest such as history, political science, or some area of business.

Program Name		Program Name	
Pre-Dental Hygiene	2 years	Pre-Optometry	3 years
Pre-Dentistry	3 years	Pre-Pharmacy	2 years
Pre-Health Information Management	3 years	Pre-Physical Therapy	3 years
Pre-Medical Technology	2 years	Pre-Veterinary Medicine	4 years
Pre-Medicine	3 years	Pre-Physician Assistant	3 years
Pre-Occupational Therapy	2 years	(Other programs in the allied sciences are available.)	

Military Science is available as a minor.

Concentrations in undergraduate programs of study are listed on the transcript.

Options in undergraduate programs of study are not listed on the transcript.

ADMISSIONS

The admission policies and practices of the University are intended to assist students of varied backgrounds including but not limited to race, religion, color, creed, sex, and disabling conditions to gain admission to the University. The University actively seeks students of diversity due to a lack of critical mass of these unrepresented groups and encourages them to apply for admission and to inquire about programs. The admission standards are designed to assure students the best possibility of success at the University.

Prompt attention is given to each application but final action is not possible until all credentials are on file with the University. Students are encouraged to apply early (up to one year before the beginning of the desired term). Gaining admission early contributes to better orientation, course planning, course scheduling and financial aid and scholarship consideration. The application deadline date for receipt of the admission application, test scores (for freshman applicants), appropriate transcripts, and other required materials is August 1 for fall entry, December 1 for spring entry, and May 1 for summer entry. Students who wish to be considered for scholarships must apply for scholarships by December 15 of the year prior to their fall semester enrollment.

Upon admission, a student must complete health requirements prior to registering for courses. The University reserves the right to modify admission policies and procedures as needed to ensure that enrollment does not exceed the facilities available.

Correspondence regarding admission should be addressed to the Office of Admissions, Box 5006, Tennessee Technological University, Cookeville, Tennessee 38505. The website for Admissions is www.tntech.edu/admissions. The e-mail address is admissions@tntech.edu.

ADMISSION TO FRESHMAN STANDING

An applicant who has not enrolled in college courses following high school graduation or receiving a high school equivalent (HSE) diploma, GED/HiSET may be considered for admission as an undergraduate freshman. To gain admission to the University as a freshman student, one must meet the following requirements:

Graduates of public and non-public (including private schools, home schools, and church-related schools) high schools must provide an official high school transcript showing credits earned and date of graduation. Provisional admissions on academic merit through the sixth or seventh semester can be made; however a final high school transcript showing graduation date and satisfactory grades must be received by the Office of Admissions before full admission can be granted. The University upholds the requirements and recommendations of the State of Tennessee for Tennessee non-public schools:

www.state.tn.gov/education/schools/non_public_schools.shtml. Out-of-state, online, and international schools are subject to a case-by-case evaluation to uphold a similar standard. Applicants who cannot provide a satisfactory secondary school credential may substitute acceptable scores on the GED or HiSET examination (see Admission by Examination (GED/HiSET Applicants)).

High School Curriculum Requirements: Students graduating from high school must complete a distribution of college preparatory courses. The required courses in the Tennessee High School Diploma provide an example of such courses (see TBR Admissions Policy 2:03:00:00 Section II.B.1.a,(4)).

Admission requirements for new freshman applicants must have a 2.5 high school GPA and a 17 ACT Composite score (or an 910 SAT Critical Reading and Math score). Additionally, new freshman applicants must score at least a 15 on each subscore of the ACT (440 SAT Reading and 420 SAT Math).

Students that are over 21 years of age are exempted from the ACT/SAT requirement but must meet the required score on a course placement exam such as the ACCUPLACER.

Students who do not meet the above requirements will be reviewed by the Admissions Review Committee and a more holistic review will be used to evaluate the application for admission. Students volunteering information regarding a handicapping condition will be assessed on an individual basis.

Admission to the College of Engineering also requires a high school GPA of 3.00, an ACT composite score of 20, and an ACT mathematics score of 22. Admission to the mathematics major also requires an ACT mathematics score of 21. Admission to the Whitson-Hester School of Nursing also requires a high school GPA of 3.00 and an ACT composite score of 20. Admission to certain pre-professional majors also requires a high school GPA of 3.00, a minimum ACT composite score of 21, and a minimum ACT mathematics score of 21. Pre-Professional majors that have different requirements other than general admission requirements include: Pre-Medicine, Pre-Dentistry, Pre-Pharmacy, Pre-Optometry, Pre-Medical Technology, Pre-Physical Therapy, Pre-Physician's Assistant, Pre-Occupational Therapy, Pre-Dental Hygiene and Pre-Health Information Management. Students who do not meet these requirements for entering a specific college or major, but do meet general admission requirements, will be admitted into the General Curriculum or General Health Studies programs accordingly.

Applicants whose native language is not English will be reviewed by the English Placement Committee. Such students may be required to take a placement test or submit test scores for the purpose of validating previous English study and/or placement in English courses, including English composition and English as a Second Language.

Applicants for admission to freshman standing who have been enrolled at another college or university must

submit official transcripts from each institution attended (see Admission as a Transfer Student for more information on official transcripts).

APPLICATION PROCEDURE FOR FRESHMEN

1. Complete the online application for Undergraduate Freshman at www.tntech.edu/applyonline by the priority deadlines listed at the top of this section.
2. All first-time applicants must provide a one-time, non-refundable fee of \$25. This fee can be paid when submitting the application online or by logging into the application portal using the same username/password the student used to create the application.
3. Request an official high school transcript showing coursework, grades, and a graduation date be sent to the Undergraduate Admissions Office. To be considered for admission during the senior year of high school, a transcript showing coursework through grade eleven (six graded semesters) is required. A final transcript must be forwarded upon graduation. If a high school diploma was not earned, a state-issued transcript of GED or HiSET scores is required. If a student has attempted any college credit (through dual-enrollment, summer courses, etc.) at any institution of higher education, such official college transcripts must be sent to the Undergraduate Admissions Office. Official transcripts must be sent from the institution attended and delivered directly to the University. Transcripts may be delivered via post or electronically through an approved vendor (see the Undergraduate Admissions website for approved vendors). Faxed transcripts are **not** considered official transcripts.
Mailing Address:
Tennessee Tech Admissions
Box 5006
Cookeville, TN 38505
4. Each applicant under 21 years of age is required to take the American College Test (ACT) or the Scholastic Aptitude Test (SAT). Scores should be requested to be sent to Tennessee Technological University when you register for the test. The school code for TTU (ACT 4012/SAT 1804). Test scores

used for admission must be no more than three years old at the first day of class. Once approved, applicants over the age of 21 must take a course placement exam such as the ACCUPLACER which is offered on Tennessee Tech's campus.

5. Additional items may be required per the Office of Admissions in order to ensure a complete review of an applicant.
6. In compliance with the requirements of the Office of Residential Life, an application and prepayment for on-campus housing should be submitted to the Office of Residential Life. (See Residential Life.)
7. Each applicant should complete and return the Student Health Form, the Hepatitis/Meningitis Wavier Form, and supply requisite immunization documentation before registering for courses. Forms are available to download from the Health Services website at www.tntech.edu/healthservices. (See "Health Requirements" section for more information.)
8. Notification will be sent via email, followed by an official letter via mail. The admission decision can also be viewed by logging into the application portal.

It is a Class A misdemeanor to misrepresent academic credentials. A person commits the offense of misrepresentation of academic credentials who, knowing that the statement is false and with the intent to secure employment at or admission to an institution of higher education in Tennessee, represents, orally or in writing that the person:

- Has successfully completed the required course work for and has been awarded one (1) or more degrees or diplomas from an accredited institution of higher education;
- Has successfully completed the required course work for and has been awarded one (1) or more degrees for diplomas from a particular institution of higher education; or
- Has successfully completed the required course work for and has been awarded one (1) or more degrees or diplomas in a particular field or specialty from an accredited institution of higher education.

ADVANCED PLACEMENT WITH CREDIT

Entering students and regularly enrolled students may obtain advanced placement with credit in certain courses by obtaining high scores on the appropriate test(s):

ACT English Subtest score of 27-30	ENGL 1010
SAT Critical Reading Subtest score of 610-690	ENGL 1010

ACT English Subtest score of 31 or higher	ENGL 1010 and ENGL 1020
SAT Critical Reading Subtest score of 700 or higher	ENGL 1010 and ENGL 1020

The ACT code for Tennessee Tech is 4012. The SAT code is 1804.

ADVANCED PLACEMENT POLICY FOR TTU
Effective July 1, 2018

A.P. Examination	Score	Course Exemption	Semester Hours
Biology	3	BIOL 1010 or BIOL 1113	4
	4	BIOL 1010 & BIOL 1020 or BIOL 1113 & BIOL 1123	8
Calculus (AB)	3	MATH 1830	3
	4	MATH 1910	4
Calculus (BC)	3	MATH 1910 & MATH 1920	4
Chemistry	3 ^a	CHEM 1110 or CHEM 1010 & CHEM 1020	4 8
	4	CHEM 1110 & CHEM 1120 or CHEM 1010 & CHEM 1020	8
Computer Science A	3	CSC 1300	4
	4	CSC 1200, CSC 1300	7
Computer Science Principles	3	CSC 1200	3
Economics: Micro	3	ECON 2010	3
Economics: Macro	3	ECON 2020	3
English Language and Composition	3	ENGL 1010	3
	4	ENGL 1010 & ENGL 1020	6
Environmental Science	3	BIOL 3130	4
English Literature and Composition	3	ENGL 2235 & sophomore English	6
European History	3	HIST 2210 & HIST 2220	6
World History	3	HIST 2310 & HIST 2320	6
French Language	3	FREN 1010 & FREN 1020	6
	4	FREN 1010, FREN 1020 & FREN 2010	9
	5	FREN 1010, FREN 1020, FREN 2010 & FREN 2020	12
German Language	3	GERM 1010 & GERM 1020	6
	4	GERM 1010, GERM 1020 & GERM 2010	9
	5	GERM 1010, GERM 1020, GERM 2010 & GERM 2020	12
Government and Politics: United States	3	POLS 1030	3
Human Geography	3	GEOG 1012	3
Spanish Language	3	SPAN 1010 & SPAN 1020	6
	4	SPAN 1010, SPAN 1020 & SPAN 2010	9
	5	SPAN 1010, SPAN 1020, SPAN 2010 & SPAN 2020	12

Statistics	3	MATH 1530	3
Physics 1	3	PHYS 2010	4
Physics 2	3	PHYS 2020	4
Physics C: Mechanics	3	PHYS 2010 or 2110	4
Physics C: Electricity and Magnetism	3	PHYS 2020 or PHYS 2120	4
Psychology	3	PSY 1030	3
United States History	3	HIST 2010 & HIST 2020	6

^a Students may submit the exam essay portion for departmental evaluation for possible credit in CHEM 1120.

CLEP (College Level Examination Program) - 25 subject matter tests from which to select - credit given in corresponding courses for acceptable scores. Credit is not given for the general examinations. For further information, contact the Admissions Office.

PLTW (Project Lead the Way Credit) – ENGR 1210 (1 credit hour) will be awarded to secondary school students who participate in the "Project Lead the Way" and achieve a minimum grade 70% on the nationalized "Final Exam on Principles of Engineering". The requesting student will need to have his/her test score sent to Tennessee Tech.

Credit by Examinations - A student who has had sufficient training or experience in a subject to merit the establishment of credit by comprehensive examination, but who has not enrolled in the same, comparable, or higher level course at the college level, may request the privilege of taking a special examination prepared by the department involved. A grade will be recorded on the permanent record.

Non-credit Courses and Professional Certification – Academic credit may be awarded on occasion for professional certification or non-credit courses. Requests for the award of such credit must be submitted to the appropriate department chairpersons. As the executor of departmental policy, he or she will evaluate the requests and submit a recommendation to accept or reject them to the college dean and Office of Records for final approval.

The ACT code for Tennessee Tech is No. 4012. The SAT code is No. 1804.

Credit obtained through test scores on ACT, SAT, CLEP and PLTW receive the grade of "S" for satisfactory and do not affect the student's quality point average. Up to 33 semester hours of credit may be obtained through any combination of advanced placement tests, military equivalency credits, correspondence courses, special departmental examinations, and extension courses. For more detailed information, contact the Office of Admissions or your high school counselor.

INTERNATIONAL BACCALAUREATE

The University recognizes the International Baccalaureate diploma and individual IB courses by awarding credit on IB higher level examinations. Some standard level examinations may also be considered for credit.

Standard-Level IB Courses

International Baccalaureate Course	Minimum Required Score	TTU Equivalent	Credit Hours Earned
Art A (SL)	4	Art Studio Elective	3
	5	ART 1035	3
	6 or 7	ART 1035, studio elective	3, 3
Art B (SL)	5 - 7	ART 1035	3
Chemistry (SL)	5 - 7	CHEM 1010, CHEM 1020	8
Economics (SL)	6 or 7	ECON 2010, ECON 2020	6
French A1 (SL)	6	FREN 1010, FREN 1020	6
	7	FREN 2010, FREN 2020	6
German A1 (SL)	6	GERM 1010, GERM 1020	6
	7	GERM 2010, GERM 2020	6
Language A1 (SL)	6	ENGL 1010	3
	7	ENGL 1010, ENGL 1020	6
Further Mathematics	No credit awarded		

Mathematical Studies (SL)	No credit awarded		
Mathematics (SL)	5	MATH 1710	3
Mathematics (SL)	6	MATH 1710, MATH 1830	3, 3
Music A (SL)	5	No credit	
	6 or 7	MUS 1030	3
Philosophy (SL)	No credit awarded		
Physics (SL)	No credit awarded		
Psychology (SL)	5 - 7	PSY 1030	3
Spanish A1 (SL)	6	SPAN 1010, SPAN 1020	6
	7	SPAN 2010, SPAN 2020	6
Sports, Exercise and Health Science (SL)	5	EXPW 1150	3
Theatre Arts (SL)	5 - 7	THEA 1030	3

Higher-Level IB Courses

International Baccalaureate Course	Minimum Required Score	TTU Equivalent	Credit Hours Earned
Art (HL)	5	Studio Elective	3
	6 or 7	Up to six credit hours studio elective with portfolio review	
Biology (HL)	5 - 7	BIOL 1010, BIOL 1020 or BIOL 1113, BIOL 1123	8
Chemistry (HL)	5 - 7	CHEM 1110, CHEM 1120	8
Economics (HL)	5 - 7	ECON 2010, ECON 2020	6
French A1 (HL)	5	FREN 1010, FREN 1020	6
	6 or 7	FREN 2010, FREN 2020	6
German A1 (HL)	5	GERM 1010, GERM 1020	6
	6 or 7	GERM 2010, GERM 2020	6
History (HL)	5 - 7	Lower-division history elective	3
Language A1 (HL)	5	ENGL 1010	3
	6 or 7	ENGL 1010, ENGL 1020	6
Mathematics (HL)	5 - 7	MATH 1730, MATH 1910	5, 4
Philosophy (HL)	5 - 7	PHIL 1030	3
Physics (HL)	5 - 7	PHYS 2010, PHYS 2020	8
Spanish A1 (HL)	5	SPAN 1010, SPAN 1020	6
	6 or 7	SPAN 2010, SPAN 2020	6
Sports, Exercise and Health Science (HL)	5	EXPW 1150	3
Theatre Arts (HL)	5 - 7	THEA 1030	3

ADMISSION BY EXAMINATION (GED/HISET APPLICANTS)

Applicants who have not graduated from high school but whose corresponding high school class has graduated must submit an official transcript of the General Educational Development (GED) or HiSET Test. A minimum of a 162 (525+

2002-2013 or 52+ pre-2002) or 13 HiSET is required for admission. An ACT score is required of (1) all applicants who are under 21 years of age or (2) all applicants regardless of age, who are seeking majors in engineering, nursing, pre-professional programs, or math. All GED/HiSET students must also take the ACCUPLACER exam unless ACT/SAT scores are

less than three years old. For specific requirement regarding ACT scores, see Admission to Freshman Standing. For application procedures, see Application Procedure for Freshmen.

PRE-FRESHMAN PROGRAM (DUAL/JOINT ENROLLMENT)

Academically talented students may be admitted into the Pre-Freshman Program by having a planned Individual Education Program (IEP). The following criteria must be met by each applicant.

1. Enrollment recommended as a part of the student's planned Individual Education Program (IEP) as determined by the multi-disciplinary team process.
2. Certified to be academically talented or gifted according to the criteria for certification of intellectually gifted which are contained in the Tennessee State Department of Education *Student Evaluation Manual*.
3. High school grade point average of at least 3.2 on a 4.0 scale.
4. Must have fully utilized the school's or school system's courses in the desired area of study, or must have satisfactorily completed tests for these courses with a score of 75 or better.

A student who does not have an IEP may be admitted to the Pre-Freshman Program by meeting all of the following criteria:

1. A recommendation from the high school guidance counselor.
2. A minimum high school grade point average 3.5 on a 4.0 scale or an ACT composite score of 25.

Admission in the Pre-Freshman program will allow enrollment in one course per semester if seats are available. Approval from the academic department to enroll in the desired course is also required. Exceptions to take more than one course may be made. Please seek permission from the Admissions Office. College credit will be given for courses that are satisfactorily completed. This admission is not available for enrollment in activity or private instruction courses. A semester grade of "B" or better is expected; however, a semester review of the student's success will be performed by the University to determine whether continued enrollment is allowed. It is expected that such students return to their high school for completion of the senior year and graduation.

EARLY ADMISSION

The high-achieving student who has completed the junior year with not less than twelve academic (English, science, history, mathematics, foreign languages) units, who has a 3.2 (on a 4.0 scale) grade point average, and an ACT composite score of 26 or higher may be considered for admission without high school graduation. All other admission requirements must be met.

A letter must be received from the high school principal specifying the college courses that will be substituted for the remaining high school courses.

Letters of recommendation from the high school counselor and from a parent must also be received.

Early Admission students should follow the admission procedures as freshmen (see Application Procedure for Freshmen).

Financial Aid eligibility requires proof of a high school diploma or high school equivalency exam.

ADMISSION AS A TRANSFER STUDENT

An applicant who has begun college elsewhere following high school graduation or the awarding of a high school equivalent diploma (GED or HSE) is a transfer student. If the student has completed less than twenty-four transferable semester hours of degree credit (college-level courses), the applicant will be evaluated using a combination of the admission requirements for freshmen and transfer applicants.

1. Transfer applicants must meet the following academic standards based on all of their previous college-level coursework at all institutions. (1) Must have a minimum cumulative GPA of 2.0; (2) Must have at least a 2.0 in their last full-time semester (or last 12 hours for part-time students).
2. Transfer applicants having graduated from a Tennessee Board of Regents community college with an A.A. or A.S. degree in a university-parallel program will usually be eligible for admission.
3. An applicant under disciplinary suspension or probation will not be considered for admission until a satisfactory statement has been furnished by the former college and approval given by the Admissions Review Committee.
4. Students who do not meet the above requirements will be reviewed by the Admissions Review Committee. Students volunteering information regarding a handicapping condition will be assessed on an individual basis.
5. Applicants whose native language is not English will be reviewed by the English Placement Committee. Such students may be required to take a placement test or submit test scores for the purpose of validating previous English study and/or placement in English courses, including English composition and English as a Second Language.

APPLICATION PROCEDURES FOR TRANSFER STUDENTS

1. Complete the online application for Undergraduate Freshman at www.tntech.edu/applyonline by the deadlines listed at the top of this section. A
2. All first-time applicants must provide a one-time, non-refundable fee of \$25. If the applicant has previously paid the UG application fee, then the applicant is not required to pay the UG application fee again.
3. Submit official transcripts of all work completed and a partial transcript if presently enrolled in coursework. Tentative admission may be granted on the basis of partial transcripts if the quality of work at previous institutions is clearly meets admission requirements. Submit official final transcripts when all work is completed. Transcripts of all work attempted at the college-level must be furnished. Final admission is granted only after all transcripts and credentials are received. Official transcripts originate from the institution attended and are delivered directly to the University. Transcripts may be delivered via post or electronically through an approved vendor (see the

Undergraduate Admissions website for approved vendors). Faxed or emailed transcripts are **not** considered official transcripts.
Mailing Address:
Tennessee Tech Admissions
PO Box 5006
Cookeville, TN 38505

It is a Class A misdemeanor to misrepresent academic credentials. A person commits the offense of misrepresentation of academic credentials who, knowing that the statement is false and with the intent to secure employment at or admission to an institution of higher education in Tennessee, represents, orally or in writing that the person:

- Has successfully completed the required course work for and has been awarded one (1) or more degrees or diplomas from an accredited institution of higher education;
 - Has successfully completed the required course work for and has been awarded one (1) or more degrees for diplomas from a particular institution of higher education; or
 - Has successfully completed the required course work for and has been awarded one (1) or more degrees or diplomas in a particular field or specialty from an accredited institution of higher education.
4. Students who have NOT earned 24 transferrable college-level hours are required to submit an official final high school transcript or GED/HiSET scores. Those who have not completed college-level Math or English courses must follow ACCUPLACER testing guidelines. Students under the age of 21 who have completed fewer than 24 semester hours must also submit ACT/SAT scores.
 5. Additional items may be required per the Office of Admissions in order to ensure a complete review of an applicant.
 6. In compliance with the requirements of the Office of Residential Life, an application and prepayment for on-campus housing should be submitted to the Office of Residential Life. (See Residential Life.)
 7. Each applicant should complete and return the Student Health Form, the Hepatitis/Meningitis Wavier Form, and supply requisite immunization documentation before registering for courses. Forms are available to download from the Health Services website at www.tntech.edu/healthservices. (See "Health Requirements" section for more information.)
 8. Notification of the admission decision will be sent via email and be available online. If admitted, information concerning orientation and registration will follow either via mail or electronically. Admission decision can be viewed by logging back into the application portal.

READMISSION OF FORMER STUDENTS

A former student of the University must file an application for re-admission. The application may be obtained online at www.tntech.edu/applyonline and should be filed no later than

thirty (30) days prior to the first day of class to be considered for the semester in which he or she wishes to enroll. No application fee is required.

A former student who has been suspended two or more times or dismissed must submit a Request for Readmission After Suspension instead of the application for re-admission no later than 10 days for domestic students and six weeks for international students prior to the beginning of the semester in which he or she wishes to enroll. Admission decisions for suspended or dismissed students are determined by the Admissions and Credits Committee.

Students should contact the Office of Residential Life concerning on-campus housing requirements (See Residential Life).

ADMISSION AS A SPECIAL UNDERGRADUATE STUDENT

A Special Undergraduate student is not a candidate for a degree; however, this classification allows one to register for **undergraduate** courses, obtain grades, and have these grades recorded on an official University transcript. This classification includes students who have and have not yet received a bachelor's degree. Applicants who are not currently in good standing at the last college attended cannot be admitted as a Special Undergraduate student. Admission as a Special Undergraduate student may be granted a person if it appears that he or she may successfully engage in college work and that enrollment will be beneficial to the person and to the University.

Admission as a Special Undergraduate Student does not guarantee enrollment in any course. After gaining admission, the student is subject to normal procedures for registering for courses. Application for admission to this classification should be filed at least thirty (30) days prior to the beginning of the semester in which enrollment is desired. All fees are the same as for regular students.

All individuals wishing to be admitted in this classification should select "Non-Degree Seeking/Special" as a major and indicate "Special" status. The ACCUPLACER assessment is required for students enrolling in English or mathematics courses. Special students are not eligible for federal and state financial aid.

ADMISSION FOR SECOND BACHELOR DEGREE OR TEACHER CERTIFICATION

A student working towards a second baccalaureate degree or teacher certification is one who has already earned a bachelor's degree and is not working toward a graduate degree, but who takes graduate or undergraduate courses for credit toward a second undergraduate degree or teacher certification. Students must apply for admission (or readmission) to enter this classification and those entering the University for the first time must pay a one-time, non-refundable application fee of \$25. A student who is seeking a second undergraduate degree should file an application for graduation during the first semester of attendance. A student should *not* register for graduate courses without prior permission from the Associate Vice President for Research and Graduate Studies. **Credit earned in this classification cannot be counted for graduate degree purposes.**

ADMISSION TO CLASS AS AN AUDITOR

An auditor is one who enrolls in classes on a non-credit basis, is expected to attend class, but is not required to hand in assignments or to take examinations. If the instructor is not satisfied with the attendance, the instructor may assign a grade of "W." A student who audits must be admitted to the University as a regular or special student.

Admission to class as an auditor requires the consent of the advisor, consent of the instructor and the approval of the Office of Records and Registration. The applicant should secure the Audit Registration Form from the Office of Records and Registration. Fees for audit courses are the same as those for credit courses.

Audit requests will be processed only until the last day to register, add, or change sections as published in the University Academic Calendar each semester. An audit grade cannot be reversed for a letter grade once the semester begins.

Students are not allowed to audit Learning Support Program courses.

ADMISSION AS A TRANSIENT STUDENT

A transient student is one who is regularly enrolled in another collegiate institution and desires admission for one semester. The student is required to submit an application for admission (available online at www.tntech.edu/applyonline) and to provide a letter of good standing from the college in which he or she is enrolled. The student should indicate "Transient" status and select "Non-Degree Seeking/Special" as a major. Credit is given and transient admission is for one semester only. A transient student who wishes to become a regular student must file the appropriate admission application and meet the requirements for admission as a transfer student.

Transient students are not eligible for federal and state financial aid.

ACADEMIC FRESH START

"Academic Fresh Start", in accordance with Tennessee Tech Policy 1205, is a plan of academic forgiveness which allows undergraduate students who have experienced academic difficulty to make a clean start upon returning to college after an extended absence. The Academic Fresh Start allows eligible students to resume study without being penalized for his/her past unsatisfactory scholarship and signals the initiation of a new QPA/GPA to be used for determining academic standing. Readmitted students who were formally enrolled in the institution as well as transfer students who meet institutional requirements for admission and who have been separated from all institutions of higher education for a minimum of four (4) years are eligible for the Fresh Start. Any time after the admission or readmission as a degree-seeking student, a student may file formal application to the Office of Enrollment Management describing an academic plan and requesting the Academic Fresh Start. A student may be granted a Fresh Start only once. After applying for Fresh Start, completion of at least fifteen (15) semester hours of earned degree coursework with a minimum QPA of 2.0 is required for all work attempted in order for Fresh Start to be granted.

Terms of Academic Fresh Start:

1. The student's permanent record will remain a record of all work; however, courses taken and previously failed will be excluded from the calculation of the QPA/GPA. The student's transcript will note that the Fresh Start was made and the date of the Fresh Start.
2. Courses with a D grade will also be excluded from the calculation when a grade of C or better is required in the student's current major.
3. QPA, GPA and credit hours will reflect courses for which passing grades were earned and retained.
4. Retained grades will be calculated in the Fresh Start QPA/GPA.
5. Courses with D or F grades must be repeated at the institution when they are required in the student's current major.
6. All remaining courses for the current degree objectives must be completed at the institution.
7. No transient credit will be accepted after invoking Academic Fresh Start.
8. The application of retained credit toward degree requirements will be determined by the requirements currently in effect at the time the academic renewal status is conferred on the student.
9. Specific program regulations must also be met.
10. Previously satisfied ACCUPLACER requirements will not be forfeited.
11. Upon degree admission, Fresh Start applicants who did not satisfy ACCUPLACER requirements at the time of previous enrollment and whose academic plan includes completion of a college-level English or mathematics course must meet current ACCUPLACER requirements regarding enrollment in college English and mathematics courses.
12. This policy is independent of financial aid regulations. Financial aid requirements at the time of application will apply. Therefore, a Fresh Start applicant should check with his/her financial aid counselor for guidance.

HEALTH REQUIREMENTS

There are health requirements with which the student must comply prior to beginning classes. These requirements are not for the purpose of limiting admission, but are to promote a healthy student body.

1. Complete the Immunization Health History form (with official medical documentation and/or medical provider's signature). See www.tntech.edu/healthservices/immunization/ for a complete listing of immunization requirements.
2. State law requires each postsecondary institution in Tennessee provide students with information concerning hepatitis B and meningococcal meningitis infections. All students must complete a *Meningococcal Meningitis and Hepatitis B Immunization Health History Form*.
3. All new incoming students living in on campus housing under the age of 22 must submit proof of having meningitis vaccine on or after their sixteenth birthday before you will be allowed to live in on-campus housing.

4. A TB skin test or assessment is recommended before enrollment for international students or documentation of negative chest x-ray with history of positive titer.

PLEASE COMPLETE THESE AND RETURN TO THE STUDENT HEALTH SERVICES PRIOR TO BEGINNING CLASSES. Forms are available online at www.tntech.edu/healthservices.

Special programs of study such as nursing may have additional requirements.

RESIDENCE CLASSIFICATION

In accordance with [TBR Policy 3:05:01:00](#) and [TTU Policy 1201](#), every person having his or her domicile in this State shall be classified "in-state" for fee and tuition purposes and for admission purposes. Every person not having his or her domicile in this State shall be classified "out-of-state" for said purposes. The domicile of an un-emancipated person is typically that of his or her parent. Students once classified as "in-state" or "out-of-state" will maintain such classification for fee paying purposes during continuous enrollment.

Changes to residence classification are initiated by the student. A request for review must be submitted to the Office of Admissions at least thirty (30) days prior to the beginning of the desired term and adequate information must be provided by the student to warrant a review of resident status. Requests for a first appeal must be made in writing to the Residency Committee within 30 calendar days, absent good cause, of notification from the initial decision of the Residency Classification Officer. Requests for a second appeal must be made in writing to the Vice President for Enrollment Management and Career Placement within 30 calendar days of notification of the first appeal decision. The decision of the Vice President will be final.

If a student classified out-of-state applies for in-state classification and is subsequently so classified, his or her in-state classification shall be effective as of the date on which reclassification was sought. However, out-of-state tuition will be charged for any quarter or semester during which reclassification is sought and obtained unless application for reclassification is made to the admissions officer on or before the last day of registration of that quarter or semester.

ADMISSION OF INTERNATIONAL STUDENTS: UNDERGRADUATE STUDY

Tennessee Technological University encourages its faculty, staff, and administrators to foster the enrollment of qualified international students in suitable programs, to work with Embassies and Sponsoring Agencies to attract students whose academic potential has already been recognized in their home countries, and to provide appropriate services for international students who enroll at the University. Admissions applications for international students may be obtained from Tennessee Tech's website: (www.tntech.edu/internationaladmissions/).

An international student is classified for educational purposes as a person who is a citizen and permanent resident of a country other than the United States. **Tennessee Tech University is authorized under Federal law to enroll non immigrant alien students.**

All international students whose native language is not English must have an official Test of English as a Foreign Language (TOEFL) score or its equivalent. The

admission requirements for international students applying to college for the first time are as follows:

1. Be at least 16 years of age.
2. Graduate from a Secondary School with proof of such with diploma and support documentation showing all years of high school course work.
3. Demonstrate competence in basic courses at the secondary level that are closely related to the intended major program of study at the University
4. International students who will be applying for a student visa are recommended to complete the application 3 to 6 months in advance. Students who reside in the USA may apply up to one month in advance. The following items are required for final admission.
 - a. \$40 non-refundable application fee.
 - b. Test which demonstrates proficient English skills (for students from countries where English is not the primary language). TOEFL test scores should be sent directly from the testing agency. Please use the institution code of 1804 when requesting that scores be submitted directly to TTU. A TOEFL institutional score of 490 or its equivalent on the internet based TOEFL or Computer Based TOEFL will be acceptable for a provisionally admitted student and the student must maintain 2.0 cumulative grade point average by the end of the 2nd semester or the student will be dismissed. Acceptance of Institutional TOEFL scores originating from Intensive English Language Programs (copy accepted since only one copy is issued or guaranteed by school administrator). If TOEFL test scores are not available, then alternative tests can be submitted for admission. Students may provide an alternate test such as ONE OF THE FOLLOWING (which can be used in place of the TOEFL requirement).

Please provide one of the following tests for Admission to TTU to replace the TOEFL test.

TEST ORIGINATOR	Minimum Score required
TOEFL – Test of English as a Foreign Language	490 paper-based 163 computer-based 57 internet-based
IELTS – International English Language Testing System	5.0
EIKEN	2 A Grade (College of Junior College Level)
TOEIC - Test of English for International Communication	580
ITEPS (The International Test of English Proficiency)	4.5
Pearson PTE	52 ELS level 109 FLS International Level 7

English Language Program Levels	International English Institute Nashville Level 6 The Language Company Level 8
Michigan Test (MELAB)	80
Cambridge IGCSE or O Level English	Level O/A/ AS levels
International Baccalaureate (IB Credit)	IB credit of C or better in the IB English course
Two semesters or three quarters of college-level English composition from an accredited college or university (Non-USA based schools may require the WES or another NACES member).	C grade or better from an accredited US Canadian/British/New Zealand or Australian based college
ACT	English 19 *can be used to replace the TOEFL requirement Math 19 Reading 19
SAT	Critical Reading 460 *can be used to replace the TOEFL requirement Math 460

*Note: TTU offers conditional letter of admission to applicants who meet the academic and financial requirements but whose English language proficiency does not meet the levels for full admission. Students who receive a Conditional letter of admission must provide one of the English test scores or provide proof of completion of one of the ESL Language Center completion levels. The student upon arrival at TTU to assess their need for additional language instruction must take the Placement Exam in reading, writing and math. If the Placement Exam shows the student needs additional English support, then he/she must enroll in additional English language courses, taught through the FLS International center at TTU. These courses will likely delay the start of a student's academic program. Students may also be asked to take the Placement Exam math, reading and writing test again in Learning Support at the end of their FLS international coursework.

International Undergraduate students who complete advanced levels at partnered Intensive English Language programs will be permitted to enroll at Tennessee Tech University by waiving the English test score requirement. These students must meet all other requirements for admission at TTU. These students must also take the reading, writing, and math Placement Exam prior to registering for classes. The students whose Placement Exam results do not meet the requirements for Learning Support courses or English Composition will be required to enroll in classes at FLS International.

5. Students must also provide an official academic record which includes all courses and all years completed at the secondary (high school) level, which includes grades earned, final examination scores, diplomas, matriculation record or leaving certificate. The admission decision will be based on the student's own educational grading system. All records should be in the original language with the institution's seal, records from nations in which the first language is not English must be accompanied by a certified English translation. Students who have advanced placement credits such as the AP, SAT Subjects exam, GCE levels (A-levels, O-levels, AS-levels), International baccalaureate (IB), Sijil Pelajaran Malaysia (SPM), Abitur from Germany, IGCSE, HKALE, Studentsprof /Menntaskoili and Italian Maturita exam scores must provide these documents during their application. As a result the students will be eligible for credit (there is a limit of 33 credits can be used for a student's program of study).
6. International Undergraduate Students who plan to transfer credits from a university or college program from abroad must be accredited via the [World Higher Education Database](http://www.worldhighereducationdatabase.org) or <http://www.whed.net/home.php> which covers 181 countries.
 - a. Students will need to provide course descriptions in English.
 - b. If an institution is not listed in the World Higher Education Database, the applicant will be required to have all transcripts evaluated by an accredited evaluation firm which can be found at NACES website which is listed at: <http://www.naces.org/members.htm>. The student's home institution is required to submit originals to the selected evaluation firm. Some of the most commonly used evaluation firms include Educational Perspectives (www.edperspectives.com) WES, Josef Silny, Global Credential Evaluators, and Foreign Academic Credential Service
 - c. Course descriptions in English are required for the departments to properly evaluate a student's overseas coursework.
 - d. Upon arrival to TTU, the student must meet with the departments pertaining to their courses to determine if the individual department chairpersons will assign and transfer credit in regards to equivalency of each class.
 - e. The Office of International Education is not responsible for the acceptance or denial of coursework of the academic departments.
7. Students who plan to apply for an F-1 visa or J-1 visa must also submit a bank document from their personal bank account or the student's parent or sponsor verifying the student has sufficient funds to sponsor their program of study for one year. We recommend the student contact the immigration specialist in the Office of International Education. The letter from the bank must provide proof of the funds on deposit, indicating the availability of the funds and the period for which the funds have been on deposit.

Please contact the Office of International Education to determine the minimum balance for issuance of ones I-20. The estimate of fees includes tuition and registration fees, books and supplies, room cost, meal cost, grooming, insurance, recreation and travel, for three semesters or one academic year. TTU offers financial assistance in the form of part-time work on campus at minimum wage with a limit of 20 hours per week (positions are competitive and not guaranteed). International Undergraduate scholarships are available for new undergraduate students, please contact the Director of International Education for the application and requirements. A student must apply and be accepted to be given consideration for any of the Office of International Education's scholarships. Short-term loans are available in emergency cases. Grants or scholarships available for non-immigrant F-1 or J-1 students are extremely limited. Deadline for scholarships from the departments, need-based and academic, is December 15th, the year before the term. December 15th is the deadline for both the fall and spring terms. The Honors program offers scholarships for students with a GPA of 3.5 and a very high ACT or SAT scores.

8. A housing application for living on campus is available at

<http://www.tntech.edu/reslife/applications/>. There is a \$100 deposit which is not transferable. Students may request a refund if they know they will not be attending TTU 2 months in advance to their start date.

9. Non-immigrant students graduating who are studying in the USA must submit the following additional documents to complete their application to TTU:
 - A photocopy of the passport showing the expiration date and bio page.
 - A photocopy of their current visa
 - A photocopy of the current I-20 or DS2019.
 International Advisor's Reference Form will need to be submitted to TTU from your current program advisor (this form is available from TTU's Immigration Specialist.)
10. Students must also complete and submit student health forms prior to the beginning of classes. Students must provide proof of 2 doses of the Measles, Mump, and Rubella (MMR) vaccinations/ inoculations and submit a TB skin test with proof of a negative result in writing or xrays (with proof being TB free) or visit TTU's Health services office to have the required test or inoculations (these test are not free). The Varicella (Chicken Pox) vaccine is also required for students who cannot show proof of a previous diagnosis as a child or adult. The vaccine requires two inoculations. Students who do not complete the above inoculations/vaccines will not be eligible to register full-time until these exams and inoculations are completed. If students cannot locate their proof of inoculations, they may request a blood test called a titer to determine if the students have the antibodies--thus removing the requirement of proof for MMR, and Chicken pox. The student health forms can be found at the Health Services website at

<http://www.tntech.edu/healthservices/forms/>. Students can either send the inoculations directly to TTU's health services or to the Office of ISA at PO Box 5093 1 William L Jones Dr room 135 Cookeville TN 38505.

11. International Students will be permitted to enter the USA from abroad at least 60 days prior to the beginning of the semester. An F-1 student should not leave home prior to receiving a TTU Certificate of Admission and the I-20 (Certificate of Eligibility). A J-1 student should not leave home prior to receiving a TTU Certificate of Admission and the DS 2019 (Certificate of Eligibility for Exchange Visitor Status). Before applying for one's visa, a student must pay the SEVIS fee of \$200 at <http://www.ice.gov/sevis/i901/>. Frequently asked questions on the SEVIS fee can be found at <http://www.ice.gov/sevis/students>. Students who are initially applying for a visa MUST pay the SEVIS fee (I-901). Students presently in the USA do not need to this requirement. These documents, as well as the sponsor's financial letter must be presented to the certifying officer at the American Consulate General's office in order to obtain an F-1 or J-1 visa.

REQUIREMENTS FOR INTERNATIONAL STUDENTS ON ARRIVAL AT TTU

1. **ENGLISH PLACEMENT TEST.** All international students whose native language is not English are required to take Placement Exam if they have not taken the ACT or SAT exam. This includes English as a Second Language (ESL) and/or English composition. The cost of the English placement test is \$10 and \$20 for any retakes thereafter. To take the English Placement test, a student must provide identification. Students that score below the established norm for placement in the Learning Support coursework may not take regular courses which require reading and writing (e.g. psychology, US History and literature) until their English is at an acceptable level thus the student will be required to enroll in FLS International English courses.
2. **ENGLISH AS A SECOND LANGUAGE (ESL).** Unless specifically exempted by the Placement Exam, all international students are required to take READ 1100 Learning Support for Writing I [taken concurrently with ENGL 1010 Writing I] unless they provide an ACT or SAT score which exempts them from taking the exam; these classes must be completed during their first two semesters at TTU. International students will take ESL courses concurrently-FLS International center in the discipline which is recommended based on the Placement Exam concurrently with their major program of study courses. READ 1100 Learning Support Lab for English Composition I is to be taken concurrently with ENGL 1010; READ 1010 College Reading Improvement is pre-requisite to HIST 2010 and HIST 2020.
3. **PLACEMENT TEST.** The Math test will be administered to first-semester undergraduate international students who score less than 19 in the

math portion of the ACT or less than 430 in the math portion of the SAT prior to enrollment. Some undergraduate international students are required to take the English and reading portions of the Placement Exam after passing the FLS International English course. The purpose of these tests is to validate previous math and English study and/or placement in math and English courses. These tests are required by TTU's governing body, the Tennessee Board of Regents. The Math Placement Exam is also used by the Math Department for placement of students into appropriate mathematics classes, including pre-calculus and calculus I.

4. **AMERICAN HISTORY.** All undergraduate international students who have not completed one unit in American history at the secondary school level or six hours of American history in previous college work must enroll in American history the first semester in residence and continue in consecutive semesters until they have earned six hours of American history (HIST 2010 and HIST 2020), if the student is exempted from language support such as READ 1010 College Reading Improvement; READ 1100 Learning Support for Writing I; or FLS International Language support in reading and writing.
5. International students who are required to take FLS International coursework must enroll in American history upon completion of the ESL courses provided by FLS International and READ 1010 College Reading Improvement and continue in consecutive semesters until they have earned six hours in American history (HIST 2010 and HIST 2020).
6. All international students should report to the Office of International Education upon arrival at TTU. The staff will assist the international student with checking into the residence hall, depositing checks, registration, etc., at the beginning of the semester. International services and programs are administered in this office.
7. All non-immigrant F-1 and J-1 international students will be required to purchase and maintain health insurance. The student's individual or TTU coverage must include medical expenses for accident, illness, evacuation, and repatriation.

International students who wish to apply for admission to the Graduate School should address correspondence to the Associate Vice President for Research and Graduate Studies and should use the Graduate School application forms which will be furnished upon request.

STUDY ABROAD

Study Abroad scholarships are available to help defray the costs of travel and insurance for students participating in TTU-approved programs.

Costs for the ISEP reciprocal exchange are set by TTU based on the usual fees, room, and board. Payment is made directly to TTU. Transportation, insurance, books, and incidental expenses are the only additional costs. Most forms of financial aid can be applied to the year of study abroad in the ISEP program. Students are also encouraged to participate in exchange programs with Tennessee Technological University's sister institutions abroad or pursue non-affiliated, independent

study abroad programs. In addition, the International Business and Cultures program offers study abroad opportunities through the Magellan Exchange. Information on all study abroad opportunities open to TTU students is available in the Office of International Education, Room 103 Derryberry Hall, phone 931-372-3634.

There is a course sequence to register for these international student exchanges similar to Co-op. See STUDY ABROAD in the course description section.

ADMISSION TO THE GRADUATE SCHOOL

Applicants for admission to the Graduate School should apply directly to the Associate Vice President of Research and Graduate Studies. A Graduate Catalog is available online at www.tntech.edu/gcatalog.

TRANSFER OF CREDIT

Students may not pick and choose the credit that they wish to transfer. Coursework transferred or accepted for credit toward an undergraduate degree must represent collegiate coursework relevant to the degree, with course content and level of instruction resulting in student competencies at least equivalent to those enrolled in the institution's own undergraduate degree programs. Transfer students whose transcripts show satisfactory completion of the General Education program prescribed by the Tennessee Board of Regents' Policy on Degree Requirements shall be exempted from taking additional courses that normally are a part of the general education requirements of the University, except where teacher certification regulations, major field requirements, or professional accreditation agencies require the inclusion of such courses in the program of studies.

Transfer Credit - Advanced Placement. Advanced placement credit awarded by an institution that has requirements different from those at TTU will be accepted if the student has completed the next successive course in the sequence with at least a grade of "C."

Articulation Agreements With Community Colleges. Tennessee Tech has entered into articulation agreements with the following community colleges: Chattanooga State, Cleveland State, Columbia State, Motlow State, Northeast State, Pellissippi State, Roane State, Volunteer State and Walters State. These transfer programs lead to admission with junior standing at Tennessee Tech after receiving the associate degree by the specified community college. For further information, contact the Director of Academic Services.

Advanced Standing. Students who have attended another collegiate institution may not enter as beginning freshmen. Transcripts of all work attempted at other institutions must be sent by those institutions prior to admission and will be evaluated to determine the student's standing at Tennessee Technological University. Failure to submit any transcript of previous work will be considered as falsification of the record. The acceptance of transfer credit by the University confers advanced standing upon the transfer student.

The student transferring from another institution or requesting advanced standing for educational experiences in the Armed Forces must meet the requirements of this institution for graduation regardless of the number of credits submitted for advanced standing. In instances where there is insufficient

information available to evaluate course content and level of instruction for work completed at another institution prior to enrollment, the applicant will be given a tentative evaluation and the work from such institutions will not be entered on the records until the student's transfer credits have been validated.

Advanced standing will not be granted for credit from an institution which is not a recognized college or university. An alternate plan for transfer students in this category permits the establishment of 14 hours of credit by special examination as provided below. See also, Advanced Placement with Credit.

Community College Credits. A student transferring credit from a two-year institution must complete a minimum of 50 semester hours at a senior institution. Residency and other degree requirements of Tennessee Tech must be met.

Credit in Religious Studies. Tennessee Tech reserves the right to limit transfer credit in religious studies to a maximum of 12 semester hours.

DANTES Examinations - Defense Activity for Non-Traditional Education Support. Students may earn college credit for DANTES examinations administered by the Educational Testing Service and evaluated using ACE Guidelines. Credit through DANTES examinations may not be earned for courses in which previously or currently enrolled, including courses failed in residence, for courses in which credit already has been earned in coursework at a higher level, or for both the DANTES examination and its equivalent course. Students wishing specific information on transferability regarding certain DANTES exams must check with the academic unit pertaining to the subject of the exam. DANTES examination scores must be sent to the Office of Admissions on an official transcript form sent directly from the Educational Testing Service (ETS). See the Transfer Coordinator for further information on DANTES tests.

Educational Experiences in the Armed Forces. In evaluating armed services credit, Tennessee Technological University follows the recommendations of the Guide to the Evaluation of Educational Experience in the Armed Services, published by the American Council on Education, if there is equivalent course content at Tennessee Tech. Servicemembers should be prepared upon entrance to present to the University their discharge or service records (Form DD-214), or a transcript of credits earned while in the armed services, for evaluation. Students who have had 4 or more months of active service in the U.S. armed forces may be given credit not to exceed the 8 hours for the military science course. A student requesting credit for prior ROTC training or active Military Service must obtain certificate from the Department of Military Science. When appropriate, the allowable credit may be given in freshman and sophomore physical education. Tennessee Technological University is a member of Servicemembers Opportunity Colleges and participates in the Concurrent Admissions Program (ConAP).

International Transfer Credit. Any undergraduate student (domestic, permanent resident or international) who completed coursework abroad (with the exception of study abroad with TTU) is required to have coursework evaluated by a member of the National Association of Credential Evaluation Services (NACES) www.naces.org. A course by course evaluation is required for any transfer credit to be awarded.

The credit will be posted as elective credit and the grades will be posted based on the evaluation report and transcript. To

appeal credit for a specific course offered by TTU, the course description must be supplied in English to the International Education Office or the Undergraduate Admissions Office. The department chair of the course's discipline will review to determine if the course is equivalent.

A student who does not submit their transcripts to a NACES organization for evaluation will not receive any credit. Transcripts must be submitted to Undergraduate Admissions Office and to the Office of International Education for admission purposes. Not submitting the information could be grounds for dismissal from the University.

Credit Established by Professional Certificate or Non-Credit Courses. Academic credit may be awarded on occasion for professional certification or non-credit courses. Requests for the award of such credit must be submitted to the departmental chairperson of the department in which credit is being sought. As the executor of departmental policy, he or she will evaluate the requests and submit a recommendation to accept or reject them to the college dean and Office of Records for final approval.

Establishment of Credit by Special Examination. A student who has had sufficient training or experience in a subject to merit the establishment of credit by comprehensive examination but who has not enrolled in the same, comparable, or higher level course at the college level may request the privilege of taking a special examination prepared by the department involved. The request for special examination is secured from the Office of Records and Registration, and the required signatures of approval are obtained, after which the student pays the special examination fee of \$20.00 per semester hour to the Business Office. The results of such an examination will be recorded on the student's permanent record. Not more than 14 semester hours may be established by special examination. To establish credit in this manner, a student must be enrolled in the University. Only grades of A, B, C, D and F will be assigned.

Correspondence, Extension Work and Study at Other Institutions. A student who wishes to enroll for correspondence courses, extension work, or residence study at another institution with the intention of transferring this credit to Tennessee Technological University should have prior written approval from the Dean of the school or college in which the student proposes to graduate. The appropriate request form is obtained from the Office of Records and Registration. Work taken without such approval may be presented for evaluation but will be subject to approval or disapproval. Official transcripts should be furnished immediately upon the completion of such work. Correspondence credit in Freshman English and courses which include laboratory work will not be accepted.

A student in residence at Tennessee Technological University who wishes to take correspondence work from another institution while enrolled at the University will be permitted to do so only if he or she is unable to arrange a schedule for the course on campus. The student needs to file with the Office of Records and Registration a Request for In-Residence Study at Another Institution approved by the advisor and the chairperson of the department in which the work is offered on campus before enrolling for the work. Such courses taken off campus are counted as part of the student's load and are subject to the regulations concerning load.

Not more than 60 semester hours of correspondence and credit established by special examination may be counted

toward graduation. Credit granted in the formal AP program may be more extensive. Not more than 4 semester hours of correspondence and extension credit in professional education courses may be counted toward graduation or teacher certification.

FEES

Fees, conditions of assessment, and refund policies are subject to change without prior notice by action of the Tennessee Tech Board of Trustees. All registration fees, dormitory rent and meal plan charges are payable in advance unless a deferred payment plan is approved (available for fall and spring semesters only). For more information about the deferred plan, including service charges, late fees, minimum deferrable amounts, etc., <https://www.tntech.edu/bursar/payments/> contact the Business Office Accounts Receivable section.

Maintenance fees (in-state tuition) and out-of-state tuition are calculated based upon the number of Student Credit Hours (SCH's) for which a student is enrolled including any courses taken on an audit basis. **Fee rates are based upon student level (graduate or undergraduate) rather than on the course level.** For example, a graduate student choosing to enroll in an undergraduate course will be assessed graduate level rates. The full hourly rate will apply to the first 12 hours taken by an undergraduate and to the first 10 hours taken by a graduate student. A discounted hourly rate will apply to enrollment beyond these base hours.

TN eCampus and DMBA fees are calculated separately and payable in addition to the main campus fees. Fees for TN eCampus and DMBA hours are not subject to a discount for enrollment beyond 12 undergraduate or 10 graduate hours. Full hourly rates are assessed for all TN eCampus and DMBA enrollments.

The summer semester is divided into two sessions. Students may register for the full summer or for individual sessions separately; however, full payment for the entire schedule will be required on the earliest applicable deadline. For summer semester, fees are assessed at the full hourly rate and are not subject to discount for enrollment beyond the base hours. Also note the deferred payment plan is not available for summer semester.

In addition to in-state and out-of-state tuition, other fees are applicable. See the Bursar Office website at www.tntech.edu/bursar/ for a comprehensive listing of current fees and the corresponding refund policies.

No student may enroll or receive a diploma, transcript of records, or grade report until all matured debts or obligations to the University, or any phase of its program, have been cleared.

ACADEMIC REGULATIONS AND REGISTRATION**THE SCHOOL YEAR**

The school year consists of two semesters of approximately fifteen weeks each, and a summer term of ten weeks with some courses offered in two five-week sessions. A student may graduate in three years by attending three summer terms in addition to three regular years.

The Summer School. The University maintains a summer term with some courses offered in two five week sessions. Courses are scheduled so a student may complete a semester of course work if enrolled in both summer school sessions.

New students and former students not currently enrolled who expect to attend summer school should consult the catalog section entitled "Admission and Expenses."

The summer term is considered equivalent to other semesters at Tennessee Technological University in regard to retention. The student on probation in summer is subject to the regular probation stipulations, including load and requirements for removing probation.

The official last day of the term is the Friday before graduation.

DEFINITION OF A CREDIT HOUR

Tennessee Technological University is organized on a semester basis. When the term "hour" or "credit" is used, it refers to a semester hour credit. One semester hour of credit requires one hour (55 minutes) of classroom or direct faculty instruction and a minimum of two hours out of class student work each week for approximately fifteen weeks.

Two or more hours of laboratory or studio work are required per hour of credit. An equivalent amount of work is required for practica and other academic activities that award credit. Summer, intersession or other alternate course formats require the equivalent amount of work per credit hour. Laboratory hours per credit are determined by the department or college. Semester credit hours earned in courses such as internships, research, theses, dissertations, study abroad, etc. are based on outcome expectations established by the academic program.

**Classification
(Year Level)**

Course Hours Completed	Classification
0-29.9	Freshman
30-59.9	Sophomore
60-89.9	Junior
90 and greater	Senior

Courses are numbered according to the following pattern:

Course Numbers

1001-1999	Music Courses for Multiple Credit
1000-1999	Freshman Level

2000-2999	Sophomore Level
3000-3999	Junior Level
4000-4999	Senior Level
5000-5999	Graduate Level
6000-6999	Graduate (Restricted to Graduate Students)
7000-7999	Advanced Graduate

In the Catalog listings, courses offered at the senior level that may be taken at the graduate level show the graduate course number in parentheses beside the senior number.

OFFICIAL NOTICE

A notice to report to any administrative office of the University takes precedence over all non-instructional activities, and must be answered immediately or, if received during a class, as soon as the class is over. Failure to respond to such a notice will require satisfactory explanation to the Administrative Council before the student is allowed to continue in residence.

UNDERGRADUATE DEGREE REQUIREMENTS

Each student is personally responsible for completing all requirements established for his or her degree by the University, college, and department. It is the student's responsibility to inform himself or herself of these requirements. A student's advisor may not assume these responsibilities. Any substitution, waiver, or exemption from any established requirement or academic standard may be accomplished only with appropriate approval.

In addition to the requirements listed below, other requirements for a given degree and major may be determined by consulting the portion of the catalog devoted to the particular college or school offering the degree. International students must fulfill all requirements but should consult the special provisions described in Admission of International Students: Undergraduate Study of this catalog.

1. **General Education Requirements:** 41 semester hours selected from courses in 6 categories (see table below).

General education, the foundation of the undergraduate collegiate experience, encompasses the knowledge, skills, attitudes, and values that are obtained from studies in communication, mathematics, social and natural sciences, and humanities. General education is unbounded by academic disciplines and honors the relationships among bodies of knowledge. General education develops the cognitive process of reasoning essential for effective functioning and self-directed learning. General education provides opportunities for the student:

- to think logically, critically, and creatively;
- to communicate effectively both orally and in writing;
- to read extensively and perceptively;

- to explore moral and aesthetic values, social relationships, and critical thinking through the humanities;
- to understand the importance of key social institutions, ethics and values, and how individuals influence events and function with others in these institutions throughout the world;
- to appreciate creative and aesthetic expressions along with their impact on individuals and cultures;
- to express, define, and logically explore questions about the world through mathematics;
- to use computer technology to communicate and to solve problems;
- to use acquired facts, concepts, and principles of the physical and natural sciences in applying the scientific process to natural phenomena;
- to perceive the importance of wellness and values in human life;
- to manifest a commitment to life long learning.

These outcomes will be acquired in the general education requirements with additional depth obtained in the curriculum of the major and through participation in extracurricular activities.

Common Catalog Statement Regarding General Education

Effective Fall Semester 2004, each institution in the State University and Community College System of Tennessee (The Tennessee Board of Regents System) will share a common lower-division general education core curriculum of forty-one (41) semester hours for baccalaureate degrees. Lower-division means freshman and sophomore courses. The courses comprising the general education curriculum are contained within the following subject categories:

Baccalaureate Degrees*

Communication	9 hours**
Humanities and/or Fine Arts	9 hours
(At least one course must be in literature.)	
Social/Behavioral Sciences	6 hours
History	6 hours***

Natural Sciences	8 hours
Mathematics	<u>3 hours</u>
Total	41 hours

*Foreign language courses are an additional requirement for Bachelor of Arts (B.A.) degrees. The B.A. degree requires proficiency in a foreign language equivalent to completion of two years of college-level work.

**Six hours of English Composition and three hours in English oral presentational communication are required.

***Students who plan to transfer to Tennessee Board of Regents (TBR) universities should take six hours of United States History (three hours of Tennessee History may substitute). Students who plan to transfer to University of Tennessee System universities or to out-of-state or private universities should check requirements and take the appropriate courses.

Although the courses designated by Tennessee Board of Regents (TBR) institutions to fulfill the requirements of the general education subject categories vary, transfer of the courses is assured through the following means:

- Upon completion of an A.A. or A.S. degree, the requirements of the lower-division general education core will be complete and accepted by a TBR university in the transfer process.
- If an A.A. or A.S. is not obtained, transfer of general education courses will be based upon fulfillment of complete subject categories. (Example: If all eight hours in the category of Natural Sciences are complete, then this "block" of the general education core is complete.) When a subject category is incomplete, course-by-course evaluation will be conducted. The provision of block fulfillment pertains also to students who transfer among TBR universities.
- Institutional/departmental requirements of the grade of "C" will be honored. Even if credit is granted for a course, any specific requirements for the grade of "C" by the receiving institution will be enforced. In certain majors, specific courses must be taken also in general education. It is important that students and advisors be aware of any major requirements that must be fulfilled under lower-division general education.

Courses designated to fulfill general education by Tennessee Tech University are published below. A complete listing of the courses fulfilling general education requirements for all system institutions is available on the TBR website (<http://www.tbr.edu/offices/academicaffairs.aspx?id=2930>) under Transfer and Articulation Information.

TTU COURSES RECOMMENDED FOR THE TBR GENERAL EDUCATION CORE

Communication (9 hours)	
English composition (6 hours)	
ENGL 1010 - Writing I	3
ENGL 1020 - Writing II	3
English oral presentational communication (3 hours)	
COMM 2025 – Fundamentals of Communication	3
PC 2500 - Communicating in the Professions	3

Mathematics (3 hours)	
MATH 1010 – Math for General Studies	3
MATH 1130 - College Algebra	3
MATH 1420 – Geometry Concepts for Teachers	3
MATH 1530 – Introductory Statistics	3
MATH 1630 - Finite Mathematics	3
MATH 1710 - Pre-calculus Algebra	3
MATH 1720 - Pre-calculus Trigonometry	3
MATH 1730 - Pre-calculus Mathematics	5
MATH 1830 – Applied Calculus	3
MATH 1910 - Calculus I	4
History (6 hours)	
HIST 2010 – Early United States History	3
HIST 2020 – Modern United States History	3
Humanities and/or Fine Arts (9 hours)	
At least one literature course, selected from those marked with an asterisk (*), must be included in the 9 hours.	
ART 1035 – Introduction to Art	3
*ENGL 2130 – Topics in American Literature	3
*ENGL 2235 – Topics in British Literature	3
*ENGL 2330 – Topics in World Literature	3
FLST 2520 The Cultures and Peoples of North Africa	3
FREN 2510 - French Culture and Civilization	3
GERM 2520 - German Culture and Civilization	3
HIST 2210 – Early Western Civilization	3
HIST 2320 – Modern Western Civilization	3
HIST 2310 – Early World History	3
HIST 2320 – Modern World History	3
HIST 1310 - Science and World Cultures	3
MUS 1030 - Music Appreciation	3
PHIL 1030 - Introduction to Philosophy	3
RELS 2010 - Introduction to Religious Studies	3
SPAN 2510 - Spanish Culture and Civilization	3
SPAN 2550 - Latin American Culture and Civilization	3
THEA 1030 - Introduction to Theatre	3
Social/Behavioral Sciences (6 hours)	
AGBE 2010 - World Food and Society	3
ANTH 1100 - Introduction to Anthropology	3
ECON 2010 - Principles of Microeconomics	3
ECON 2020 - Principles of Macroeconomics	3
ESS 1100 – Introduction to Environmental Studies	3
EXPW 2015 - Concepts of Health and Wellness	3
GEOG 1012 – Cultural Geography	3
GEOG 1130 - Geography of Natural Hazards	3
POLS 1030 - American Government	3
PSY 1030 – Introduction to Psychology	3
SOC 1010 - Introduction to Sociology	3
WGS 2010 - Introduction to Women and Gender Studies	3
Natural Sciences (8 hours)	

ASTR 1010 - Introduction to Modern Astronomy	4
ASTR 1020 - Introduction to Modern Astronomy	4
BIOL 1010 - Introduction to Biology	4
BIOL 1020 – Diversity of Life	4
BIOL 1113 – General Biology I	4
BIOL 1123 – General Biology II	4
BIOL 2310 - General Botany	4
BIOL 1080 - Concepts of Biology	3
BIOL 2010 - Human Anatomy and Physiology I	4
BIOL 2020 - Human Anatomy and Physiology II	4
CHEM 1010 - Introductory to Chemistry I	4
CHEM 1020 - Introductory to Chemistry II	4
CHEM 1110 - General Chemistry I	4
CHEM 1120 - General Chemistry II	4
CHEM 1310 - Concepts of Chemistry	3
GEOG 2100 - Introduction to Meteorology	4
GEOL 1040 – Physical Geology	4
GEOL 1045 - Earth Environment, Resources, and Society	4
GEOL 1310 - Concepts of Geology	3
PHYS 1310 - Concepts of Physics	3
PHYS 2010 - Algebra-based Physics I	4
PHYS 2020 - Algebra-based Physics II	4
PHYS 2110 - Calculus-based Physics I	4
PHYS 2120 - Calculus-based Physics II	4

2. Special course requirements:

- English must be taken each semester, except the summer, until this requirement is completed. ENGL 1010-ENGL 1020 may not be dropped. Correspondence credit in ENGL 1010-ENGL 1020 will not be accepted.
- The prerequisite for ENGL 1020 is a grade of C or better in ENGL 1010, and the prerequisite for a 2000-level English course is a grade of C or better in ENGL 1020. If a transfer student has completed two semesters of composition and has a grade of D in ENGL 1020, then the student must repeat ENGL 1020 before beginning the literature courses. ESL classes do not satisfy the ENGL 1010 and ENGL 1020 communication requirement of the general education core, nor do these courses count toward any degree requirements.
- All students must complete six hours of American History except those students who are majoring in Chemical, Civil, Computer, Electrical and Mechanical Engineering. If the student has not completed one unit of American History in high school, the student will be required to complete six semester hours of American History for the deficiency.
- Completion of the curriculum for the major subject and degree chosen, as outlined under the department in which the major is offered. A major is outlined under the chosen curricula and must contain at least 6 hours of 3000 or 4000 level in residence at Tennessee Technological University.
- A minimum of 120 semester hours, including 36 hours of 3000 and 4000 level upper-division credit approved courses are required for a baccalaureate degree except for Interdisciplinary Studies majors who are required 45 hours. Not more than 60 semester hours may be earned by correspondence, workshop or extension, or by a combination of these and special examination. Not more than 12 semester hours in music ensembles, Physical Education 1010-1990, and Military Science activity courses may be counted toward graduation. (Not more than 12 semester hours of credit in activity courses may be counted toward the Bachelor's degree requirement.) A student transferring credit from a two-year institution must complete a minimum of 50 semester hours at a four-year institution.
- All courses required for the major must be passed with at least a "D" on the final attempt if the student does not withdraw from the course.
- A general quality point average of 2.0 (C) and a general average of 2.0 in the courses offered in the major subject. Transfer students also must attain at Tennessee Technological University a general average of 2.0 and an average of 2.0 in the courses taken in the major subject.
- Residence:** To meet the residence requirements, a student must complete at least 25 percent of the credit

for the degree requirements including a minimum of 24 semester hours of 3000 and 4000 level course credit at Tennessee Technological University.

8. Students who are majoring in another field but are taking course work in the College of Business must limit credit for the degree in business courses to 30 hours for the 120 hour degree as limited by Association to Advance Collegiate Schools of Business (AACSB).
9. **Definition of Minors:** A minor is 15 hours. A student may elect to complete more than one minor.
 1. A minor in any specific discipline in the College of Arts and Sciences must include 6 Upper Division hours. A minor in English may not include ENGL 1010 or ENGL 1020. A minor in Mathematics must include MATH 1910 and MATH 1920 and it may not include a course numbered below MATH 1910. A minor for Arts and Sciences students requires the completion of 15 semester hours, including 6 upper-division hours, in a coherent program of study. The criterion of coherence may be met in either of two ways: (1) by following the minor curriculum prescribed by any department or college at TTU, so long as it includes at least 6 upper-division hours; (2) if such a minor curriculum is not available in the chosen department or college, by taking the 15 semester hours, including 6 at the upper division, in a single discipline—i.e., normally, courses with the same course prefix, but students should check with the department offering the minor before assuming this. Exception: A minor in physics will consist of at least 15 hours of coursework including PHYS 2110, PHYS 2120, PHYS 2420, PHYS 2920 and one upper division physics course.
 2. A minor in Art, Music or Physical Education may contain no more than 4 hours of individual instruction, ensemble, or activity courses. Other minors are defined as follows:

Agriculture: 15 hours (including 6 upper division hours) approved by the student's academic advisor.

Art: A minor in art is ART 1340 – Foundations Studio I or ART 1350 – Foundations Studio II, ART 1035 – Introduction to Art, ART 1045 - Drawing I and Studio Electives—6 credit hours.

Business: A minor in Business shall consist of ACCT 3720, BMGT 3510, MKT 3400, FIN 3210, and LAW 2810. Students must also complete ECON 2010-ECON 2020 for the Social Science component of their General Education requirements or as General Electives.

A minor in Chemistry will consist of 18-20 hours including CHEM 3010-3020 and 3410 plus two additional courses chosen from CHEM 2010, 3500, 3510, 3520, 4520, 4610, 4620. The minimum average GPA in these courses must be 2.0

Coaching: Students must complete 18 hours and must include EXPW 1150, EXPW 3091 or EXPW 3092, EXPW 3180, EXPW 4032, EXPW 4171, EXPW 4540 or EXPW 4550.

Communication: A minor in communication will consist of COMM 2025 or PC 2500 and at least 4 courses from the offered by the Communication Studies Program, two of the courses must be upper division (3000 and above). JOUR 2200-Mass Communication in a Changing Society can be applied to the minor in communication. Computer Science: Students (except Computer Engineering majors) must complete fifteen (15) semester hours of CSC courses including CSC 1310 and at least six (6) upper division CSC hours.

Computer Engineering majors may earn a Computer Science minor by completing the following courses in addition to the computer sciences coursework in the Computer Engineering major: CSC 4570 -- IT Security (3 hours), CSC 4575 (5575) -- Information Assurance and Cryptography (3 hours).

Education: Any combination of 15 semester hours chosen from Art Education (ARED), Early Childhood Education (ECED), Educational Psychology (EDPY), Elementary Education (ELED), Foundations of Education (FOED), Music Education (MUED), Reading (READ), Secondary Education (SEED), and Special Education (SPED).

Environmental Studies:¹ A minor will consist of at 15 hours of coursework, with a minimum of 6 upper-division hours, including the following: (a) HIST 3900; (b) One of the following: SOC 3600 or AGBE 4120; (c) 9 additional semester hours chosen from: AGET 3110, AGRN 1100, AGRN 1110, AGRN 3230, AGRN 4220, AGRN 4230; BIOL 3120 or 3130 or WFS 3130; BIOL 4130, BIOL 4610, BIOL 4840, ESS 3710, CHEM 4710; ENGL 4930 or ENGL 4931; GEOG 1010, GEOG 3330, GEOL 4100, GEOL 4150, GEOL 4410, GEOL 4650, GEOL 4711, SOC 3600, WFS 4500, including at least one course at the 3000-4000 level and two of the following areas of study: Agriculture, Biology, Chemistry, Geography, Geology, and Sociology (note: WFS is considered to be Biology).

Exercise Science: Students must complete 18 hours and must include EXPW 3032, EXPW 3170, EXPW 3410, EXPW 4032, EXPW 4420, EXPW 4440.

Foreign Language: A minor in French, German, or Spanish will consist of at least 15 credit hours of coursework including FREN, GERM, SPAN 3010 and FREN, GERM, SPAN 3020 and may not include FREN 2510/3510, GERM 2520/3520, SPAN 2510/3510, or SPAN 2550/3550.

Human Ecology: The minor in Human Ecology must consists of 15 semester hours of courses offered by the School of Human Ecology as follows: HEC 1010, HEC 1020, HEC 3011 and eight credit hours of HEC electives (3 hours must be upper division).

Humanities: Any combination of 15 semester hours chosen from Art (ART), English (ENGL), Foreign Languages (FREN, JAPN, SPAN, or RUSS), Music (MUS), Philosophy (PHIL), and Theatre (THEA). Note: ENGL 1010 -ENGL 1020 may not be included in the minor.

Leadership and Military Science: A minor in military science requires the completion of 15 semester hours, including 6 upper-division hours.

Manufacturing and Engineering Technology: Students must complete fifteen (15) semester hours to include nine

(9) lower division MET hours and six (6) upper division MET hours.²

Music: A minor in music is MUS 1030 - Music Appreciation, MUS 1120 - Harmony I, MUS 3010 - Music History and Literature I¹, MUS 3020 - Music History and Literature II¹, MUS Applied Study², and MUS Ensemble.

¹ Prerequisite: MUS 1030.

² Two semesters required.

Professional Communication: A minor in Professional Communication will consist of: PC 2500 or COMM 2025; and at least 12 additional hours of coursework from the following: PC 3250, PC 3700, PC 3750, PC 4850, PC 4940, PC 4970, PC 4990.

Religious Studies: A minor will consist of HIST 2310, RELS 2010 and at least six credits from: ENGL 3600, HIST 4330-4339, HIST 4520, HIST 4530, HIST 4730, PHIL 3010, RELS 3300, RELS 4041-4040, RELS 4093, RELS 4100, RELS 4300 and three credits from: ASTR 1010, BIOL 1010, ENGL 2330, ENGL 3500, GEOL 1040, HEC 3565, HIST 2220, NURS 3010, NURS 3020, NURS 3030, SOC 4120, PHIL 2250 or three credits from the previous listing.

Science: Any combination of 15 semester hours chosen from Biology (BIOL), Chemistry (CHEM), Geology (GEOL), and Physics (PHYS).

Social Science: Any combination of 15 semester hours chosen from Criminal Justice (CJ), Economics (ECON), Geography (GEOG), History (HIST), Psychology (PSY), Political Science (POLS), and Sociology (SOC).

Web Design: A minor in Web Design will consist of the following courses: CSC 1070 or an approved programming course, WEBD 1500, WEBD 2300, WEBD 4950, WEBD 4975.

Women and Gender Studies: A minor in Women and Gender Studies requires completion of WGS 2010 and a minimum of 12 additional hours of course work (including 6 upper division hours) in approved courses. A minimum of 6 credit hours must be chosen from the following core courses: ENGL 4731, HIST 4350-4359, HIST 4370, POLS 3400, SOC 2200. The remaining 6 credit hours may include additional core courses listed above or approved courses that contain a significant focus on women and/or gender, or in which a student may individually contract with course instructor to focus on women and/or gender issues. These courses include but are not limited to the following: ENGL 4920, HIST 4360-4369, HIST 4440-4449, POLS 3200, POLS 3800, POLS 4610, SOC 2630, SOC 4210, SOC 4610, HON 4010 and 4900 in various disciplines.

¹Exception: Except for Biology majors, students who did not take BIOL 1010-BIOL 1020 must take BIOL 3120 or BIOL 3130/WFS 3130 as part of the 9 additional hours.

²Exception: A minor in Business for Manufacturing and Engineering Technology consists of ECON 2010, ECON 3610; BMGT 3510, DS 3520, ACCT 3720 and BMGT

3630 or BMGT 4520 (5520) or DS 3620 or DS 3540 or MKT 3400.

10. **Exams for teaching licensure:** All students, irrespective of the College or School in which enrolled who will have completed licensure requirements for teacher education as a part of the total hours required for graduation are required to take the Praxis II (NTE) Examinations: the Core Battery and the appropriate specialty examination(s).
11. **Catalog to follow:** To graduate, a student meets the requirements of the catalog effective at the time he or she entered the curriculum, provided graduation is within seven years from that entrance date, or the catalog in effect at the time of graduation. If a student is out of the university at least one full year, the student must meet with the department chairperson upon re-entering into the program to determine which catalog to follow. "Catalog" refers specifically to degree requirements in this section. Degree requirements for all students, regardless of date of enrollment in their curricula, may be subject to change prior to the publication of a new catalog when the implementation of curricular changes is necessary to maintain quality programs. The designated catalog for graduation must be approved by the departmental chairperson if different from the one in effect when a student entered the curriculum or the catalog in effect at the time of graduation. Students entering a curriculum in the summer are expected to follow the catalog for the next academic year. A Tennessee public community college student may select the Tennessee Tech Catalog effective at the time he or she enters the community college if that student enrolls at Tennessee Tech within six years and continues in the major chosen while in community college.
12. Credit which was earned earlier than ten years prior to the proposed date of graduation will be subject to review and approval by the academic department of the student's major.
13. **Filing of application for Graduation:** All candidates for an undergraduate degree must file an application for graduation no later than the deadlines provided:
 1. For students planning to graduate in the spring semester, the graduation application must be filed no later than September 1 of the previous year.
 2. For students planning to graduate in the summer semester, the graduation application must be filed no later than December 1 of the previous year.
 3. For students planning to graduate in the fall semester, the graduation application must be filed no later than May 1 of that year.
14. **Completion of requirements policy:** With the exception of grades for courses taken at another institution during the student's final semester before graduation ("transfer grades"), all requirements for graduation, including but limited to substitution forms, grade changes, and requests for exception, must be received by the Academic Services Office (Jere Whitson 315) no later than two (2) days prior to

graduation date. In addition, all transcripts related to transfer work must be received by the Academic Services Office no later than two (2) weeks after the graduation date. The receipt of such transcripts more than two (2) weeks after the graduation date will result in the student's graduation occurring at the end of the next semester.

15. Tennessee Tech may make reasonable academic adjustments to degree requirements for qualified students with disabilities, as determined by joint agreement of the Office of Disability Services and the Office of Enrollment Management and Career Placement. Students with a disability requiring academic adjustments and accommodations must contact the Office of Disability Services.

Students may be required to take one or more tests designed to measure general education achievement and achievement in major areas as a prerequisite to graduation, for the purpose of evaluation of academic programs. Students should sign up as indicated. Unless otherwise provided for any individual program no minimum score or level of achievement is required for graduation. Participation in testing may be required of all students in selected programs, and of students selected on a sample basis.

PARTICIPATION IN COMMENCEMENT

To be eligible to participate in any commencement ceremony you must meet the following requirements:

- Have applied for graduation for that semester by the application deadline
- Be enrolled in **all** courses to complete the degree requirements during the week of final exams

GRADUATION INSTRUCTION FOR UNDERGRADUATE DEGREE CANDIDATES

For information regarding the disbursement of diplomas, caps and gowns, graduation and rehearsal, special facilities, attendance, absentia status, honors, and photographs please refer to the web link <http://www.tntech.edu/records/commencement/>

REQUIREMENTS FOR A SECOND UNDERGRADUATE DEGREE

A student may qualify for a second baccalaureate degree from Tennessee Technological University by completion of a minimum of 30 semester hours at Tennessee Technological University beyond the requirements for the first baccalaureate degree, providing the student meets all prescribed requirements in the specified curriculum for the second degree and with the approval of the chairperson of the department offering the second degree.

A person who has a baccalaureate degree from another institution* and who, in addition, desires a baccalaureate degree from Tennessee Technological University must fulfill all requirements for a second degree as stated in the previous paragraph and must complete a minimum of 25 percent of the credit for the degree in residence. TTU general education requirements will be considered met, with the following exceptions:

- a. Any general education courses that are required for progression in the major program must be completed.
- b. In addition, if the first baccalaureate degree is from a non-English-speaking university, the student must pass the reading and writing placement exam or complete all additional language support course work needed in the necessary discipline before enrolling at TTU. Depending on the placement exam results, students may be required to complete READ 1100 as a co-requisite for ENGL 1010 as well as READ 1010.

*American degrees must be accredited by an approved agency, and foreign institutions must be approved as "reputable." These approvals will be obtained through consultation with the Director of International Education, the relevant TTU department chairs, and/or appropriate faculty members.

IDENTIFYING COURSES SATISFYING THE MINIMUM DEGREE REQUIREMENTS

Although the courses fulfilling the minimum degree requirements may vary in actual design among institutions, many contain similar content. These courses are identified by common course rubrics (prefixes) and numbers in all TBR institutions to facilitate transferability. The actual courses designated by each institution to fulfill the Minimum Degree Requirements, including courses that may not be a part of the common course prefix and numbering pattern, are denoted in catalogs by the ♦ symbol. A complete matrix of courses that satisfy the Minimum Degree Requirements at all TBR institutions and an explanation of the common course rubric and numbering system are available on the TBR web page (<http://www.tbr.edu/offices/academicaffairs.aspx?id=2930>).

TENNESSEE BOARD OF REGENTS/UNIVERSITY OF TENNESSEE UNIVERSITY TRANSFER TRACK MODULE

Students who wish to fulfill core curriculum requirements for institutions in both the Tennessee Board of Regents (TBR) System and the University of Tennessee (UT) System may do so by completing the TBR-UT University Track Module. The Module consists of a sixty (60) semester hour block of courses in eight categories of subjects. The University Track Module incorporates the minimum degree requirements of all TBR and UT institutions and requires the completion of courses within the following subject categories:

- Category 1: Two English Composition Courses (normally 6 credit hours)
- Category 2: Two Mathematics Courses (normally 6 credit hours)
- Category 3: Two Science Courses (normally 6-8 credit hours)
- Category 4: Five History and Humanities Courses (normally 15 credit hours)*

*Six credit hours of history are required. The type of history required varies among public universities in Tennessee. Check university catalogs to determine the proper history courses to take. Tennessee Technological University requires American History for all majors except engineering majors.

Category 5: Two Social/Behavioral Science Courses (normally 6 credit hours)

Examples are Anthropology, Criminal Justice, Economics, Political Science, Psychology and Sociology.

Category 6: Two Multicultural or Interdisciplinary Courses or Two Foreign Language Courses (normally 6 credit hours)

Category 7: Two Physical Education Courses (normally 2 credit hours)

Category 8: Pre-major/Major Elective Courses (normally 12-15 credit hours)

The choice of courses depends upon the intended major at the university to which transfer is planned. Students planning to transfer to a Tennessee public university are expected to work with their academic advisors to ensure that all courses taken within the categories are appropriate to their intended majors. Courses to be transferred under the stipulations of the University Track Module must have been completed with the grade of "C" or better.

HONORS

Undergraduate Honors. The honor roll for each semester shall be known as the "Dean's List." To receive this honor a student shall be a full-time (12 semester hours Fall and Spring or 8 semester hours Summer), regular undergraduate, having a semester's grade average of 3.1 or higher. Learning Support courses will not be included in the calculation of grades for honors.

Commencement Honors for baccalaureate degrees shall include:

<i>cum laude</i>	3.5 quality point average
<i>magna cum laude</i>	3.7 quality point average
<i>summa cum laude</i>	3.9 quality point average

In determining commencement honors, transfer students shall receive full value for grades and credits providing that the transferring institution is regionally accredited.

HONORS PROGRAM

Tennessee Technological University provides a full Honors Program to stimulate the academically gifted student to achieve his or her full potential. Admission is limited to students with a 3.5 or better cumulative quality point average, or who do exceptionally well on entrance examinations. Those students who complete Honors Program requirements for graduation have "*in cursu honorum*" inscribed on their diplomas and transcripts and are so designated on the graduation program. For further information, contact the director of the Honors Program, and see "Honors Program".

HONOR SOCIETIES

Tennessee Technological University recognizes scholarly achievement and encourages student excellence and participation in a large number of academic organizations. Honor societies in specific areas include:

Alpha Kappa Delta (Sociology)
Alpha Lambda Delta (Freshmen)
Alpha Mu Gamma (Foreign Languages)
Alpha Pi Mu (Industrial Engineering)
Alpha Psi Omega (Theatre)
Associated Scholars Guild (Honors Program)
Beta Alpha Psi (Accounting)
Beta Beta Beta (Biology)
Beta Gamma Sigma (Business)
Chi Epsilon (Civil Engineering)
Delta Tau Alpha (Agriculture)
Epsilon Pi Tau (Industrial Technology)
Eta Kappa Nu (Electrical and Computer Engineering)
Financial Management Association National Honor Society (Finance)
Kappa Delta Pi (Education)
Kappa Mu Epsilon (Mathematics)
Kappa Omicron Nu (Human Ecology)
Mortar Board (Interdisciplinary)
Omicron Delta Epsilon (Economics)
Omicron Delta Kappa (Interdisciplinary)
Phi Alpha Theta (History)
Phi Delta Kappa (Education)
Phi Kappa Phi (Interdisciplinary)
Pi Kappa Delta (Public Speaking)
Pi Kappa Lambda (Music)
Pi Lambda Theta (Education)
Pi Sigma Alpha (Political Science)
Pi Tau Sigma (Mechanical Engineering)
Psi Chi (Psychology)
Scabbard and Blade (Army ROTC)
Sigma Iota Epsilon (Business Management)
Sigma Pi Sigma (Physics)
Sigma Tau Delta (English)
Sigma Theta Tau International (Nursing)
Society for Collegiate Journalists (Journalism)
Tau Beta Pi (Engineering)

GRADES AND QUALITY POINTS

On September 1, 1951, the University adopted a 4.0 quality point scale, changing from the 3.0 scale. Grading System. Grades are indicated by letters:

A	- excellent	AU	- audit*
B	- good	X	- absent from examination
C	- satisfactory	W	- withdrew passing*
D	- passing	S	- satisfactory*
F	- failure	U	- unsatisfactory

I - incomplete*	CU - co-op unsatisfactory*
IF - incomplete, calculated - as an F	SP - thesis(satisfactory - progress)*
NF - fail, never attended	NP - thesis (no progress)*
P - pass*	EXC - exchange program*

*Grades with an asterisk are not calculated in the Grade Point Average (GPA).

PASS/FAIL OPTION

1. The Pass/Fail option is available to all **special undergraduate students** including all full-time employees of the University pursuant to Chapter 191 of the Public Acts of 1975 and its guidelines for administration effective July 1, 1985.
2. Course prerequisites may be waived for students electing the Pass/Fail option at the discretion of the instructor.
3. The minimum requirements for a grade of "D" are necessary for a "pass" (P).
4. A course passed under the Pass/Fail system may NOT be credited toward a degree.
5. The instructor acknowledges the grade option for a student by signing the Pass/Fail option form.
6. The Pass/Fail option form will not be accepted later than the last day to add courses as published in the Online Calendar.

EXAMINATIONS AND TERM GRADES

Final examinations are held in all subjects at the close of each semester. Early examinations are not permitted.

The term grade is derived from a combination of the class grades, test scores, and examination grades, including the final examination grade, which reflect the student's total performance over the entire semester. The courses (and grades) in which each student has been enrolled appear on the University record of the student. Transcripts of these records are available. Students may view or print a grade report from Eagle Online, the student information system.

Special arrangements will be made by instructors to allow students with disabling conditions to demonstrate their knowledge and/or competency on final examinations.

Quality points. Quality points are assigned to each semester hour credit as follows:

For a grade of A, 4 quality points

For a grade of B, 3 quality points

For a grade of C, 2 quality points

For a grade of D, 1 quality point

For grades of F, IF, X, U, and NF, no quality points.

For grades of I, W, SP, NP, P, EXC, CU, and AU, are not calculated in the Grade Point Average.

Quality Point Average. The quality point average for the semester is determined by dividing the total quality points earned by the total semester hours attempted. The cumulative quality point average is determined by dividing the total quality

points for all semesters by the cumulative hours (total hours minus first repeats). Non-credit, remedial, developmental, exchange program, and courses taken for audit and co-op are disregarded in computing the college level quality point average for graduation.

When a course is repeated, only the credits for the last time the course was attempted are counted toward graduation. In computing the cumulative quality point average for graduation, the original grade is voided. Credits attempted with a grade of "W" are disregarded, but credits attempted with grades of U, X, NF and IF (incomplete calculated as F) are counted.

Grade of I (Incomplete). An "I" is assigned when a student's performance has been satisfactory, but for reasons beyond the student's control, he/she has not been able to complete the course requirements within the allotted time as determined by the instructor. **Students are not required to register for the courses again.** The faculty member files a form in the departmental office outlining the requirements necessary to satisfactorily complete the course at the time final grades are filed. A student has one calendar year or until the time of graduation, whichever comes first, to remove the "I" during which time the "I" is excluded from the calculation of the student's QPA. If the "I" is not removed within the above time limitations, it remains on the student's record permanently and is treated as an "F" in calculating the student's QPA. The "I" grade will appear as an "IF" on the transcript when calculated as an "F" grade.

Midterm Grades. The University recognizes that early warnings are beneficial for students having difficulty in a course. We commend those faculty members who encourage individual or group help sessions and recommend tutorial laboratories. We recommend that faculty members structure and clearly define the grading system in order that students can determine by mid-term their level of performance. We further recommend that faculty members, whenever possible, contact students at mid-term who are performing poorly and offer assistance and suggestions for improvement. One component of the University's efforts to improve retention involves the implementation of a policy whereby all students having completed fewer than 30 hours of credit will receive a "Midterm Grade" for the courses in which they are currently enrolled, which can be viewed online by the student's advisor. A general outline of the proposed procedure is shown below.

Instructors will indicate whether the student's progress at Midterm was satisfactory (A, B, or C) or unsatisfactory (D or F). It is assumed that each instructor will be readily able to assess whether or not a student's progress was satisfactory. It is also assumed that faculty advisors will make efforts to use this information to assist the student. Midterm grades or lack thereof may not be used as an issue in a grade appeal.

For more specific instructions or information concerning midterm grading, please contact the Office of the Registrar located in Jere Whitson Building, Room 221.

ACADEMIC STANDARDS

Tennessee Technological University expects all students to strive for the highest academic achievement of which they are capable. Knowing that grades, once obtained, become a permanent record, the University is desirous that grades truly represent student accomplishment. A quality point average (QPA) of 2.00 is required to be eligible for the baccalaureate

degree. This means that a 2.00 QPA is required over all college work taken, for all courses taken at Tennessee Tech, and for all courses taken in the major field.

It is the intention of the University to give the student ample opportunity to demonstrate satisfactory work. To achieve this purpose, a graduated retention standard scale has been adopted. A student who desires to raise his or her quality point average is encouraged to repeat courses in which he or she has unsatisfactory grades, to consider a reduced load, and to evaluate the choice of major.

Warning. Students who fail to satisfy the minimum semester QPA standard as given in (column 2, Retention Table) will be placed on academic warning. Students who have been issued an academic warning and who fail to meet the minimum semester QPA standard (column 2, Retention Table) the next semester enrolled will be placed on academic probation. In cases where, concurrently, the semester QPA would indicate academic warning and the cumulative QPA would dictate academic probation, the student will be placed on probation.

Probation. Students who fail to maintain the cumulative or current quality point average required for unconditioned retention are placed on probation. This indicates that the quality of work performed is not satisfactory and the student is in danger of suspension unless his/her achievement shows the required improvement.

A student on probation must not enroll in more than sixteen hours and must remove the probation status the next enrolled semester by exceeding the requirements of the Academic Retention Table. A student on probation that meets the semester average requirement but does not equal the cumulative requirement of the Academic Retention Table will continue on probation.

Suspension. Any student who has been placed on probation and who fails to meet both the required cumulative QPA standard (column 1, Retention Table) and semester QPA standard (column 2, Retention Table) the next semester enrolled will be suspended for a minimum of one semester. The summer term may not be counted as the term of suspension. The only exception to the previous statement is that a student placed on probation and who earns a semester QPA of at least 2.0 (or required minimum semester QPA) the next term enrolled, but who does not raise his/her QPA to the required cumulative QPA standard (column 1), will remain on probation. A student on probation who receives grades of only "S" and/or "W" will incur academic suspension, due to the fact that his/her QPA did not meet the semester QPA standard (column 2, Retention Table). A student suspended for a second time must remain out of school for one calendar year. If a student is suspended a third time, the student will be denied enrollment in the University for a period of two calendar years. The student may wish to enroll at a community college during that time. If a student remains out of school for four years, the student is eligible to apply for "Academic Fresh Start," which allows the student to begin a brand new academic career.

Retention Table (Effective Fall 2010)

Cumulative Quality Hours Attempted Minus First Repeats	Required Minimum Cumulative Quality Point Average (Column 1)	Required Minimum Semester Quality
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		Point Average (Column 2)
0.0 - 29.09	1.50	1.50
29.10 - 50.09	1.75	1.75
50.10 - and above	2.00	2.00

Readmission After Suspension. A student suspended for the first time will be accepted for readmission after one full fall or spring semester away from all institutions of higher education. The student must apply for readmission at www.tntech.edu/applyonline/. Readmission to the institution is subject to satisfactory performance at previous institutions if the student chooses to enroll at another institution while away from the University. A student applying for readmission after a second or third suspension should follow the procedure listed below AFTER being away from the University for one calendar year for a second suspension and two calendar years for a third suspension. An exception to this required leave may be made for the student who completes an Associate of Arts or Associate of Science degree in a university parallel curriculum at a community college in the interim.

1. Student must submit the "Readmission after Suspension" form at least ten days prior to the beginning of the semester. International students need to apply six weeks before the beginning of the semester.
2. Student must provide any supporting documents or current academic transcripts to accompany the readmission application.
3. Student may personally explain to the Dean (or his/her designee) of his/her college the reasons for seeking readmission.
4. The readmission application and dean's/designee's recommendation will be considered by the University Admissions and Credits Committee.
5. Student will be notified by mail or email from the Office of Admissions about the status of the readmission application and the terms of readmission, if granted.

Appeal. A student may appeal part or all of his/her required leave from the University by completing the "Readmission after Suspension" application process at least ten days (or six weeks for international students) prior to the desired term of enrollment. During the appeal process, most of the suspensions are upheld with exceptions being made only when rare extenuating circumstances exist. The Admissions and Credits Committee will usually require the student to wait one semester before he or she can be readmitted.

REGISTRATION

Registration is available to all formally admitted students and consists of four steps, advisement, enrollment in courses, conformation of enrollment and payment of fees. A student must be registered to attend classes.

The Web site <https://www.tntech.edu/em/records/registration> contains detailed instructions for completing registration.

Registration Holds. A student may not have finalized all University requirements which results in a registration hold. This "hold" locks the registration process and the student is required

to report to the appropriate office before registering to have the hold removed. A student may view their registration holds, if any, by accessing Student Records, then View Holds under the Registration Menu on Eagle Online.

Late Registration. Registration is not complete until all fees for the semester have been paid. See www.tntech.edu/bursar for fee payment/confirmation instructions. A \$100 nonrefundable fee will be charged during the entire late registration period as announced in the University Online Calendar.

CHANGES IN REGISTRATION

Change of Schedule. A student may add a course via Eagle Online (www.tntech.edu/eagleonline) until the seventh calendar day of the semester. To drop a course after the 14th calendar day, a drop/add form signed by the student's advisor is required. To add a course, the student's advisor and the instructor of the course must sign the drop/add form. All drop/add forms must be brought to the Registration Center in Jere Whitson, Room 221.

Dropping a Course. A student may drop a full-term course, except required English Composition or a First Year Connections course, without receiving a grade during the first 14 calendar days of any term that is longer than seven weeks. For terms shorter than seven weeks, the first seven days will be utilized. A student may drop a course with the grade of "W", beginning the 15th day of the semester through the Friday of advisement week. All students must have advisor's signature on a drop/add form. All students dropping any chemistry course with a lab, will need to obtain the chemistry chair's signature. (See the online calendar's academic schedule for "Last day to drop with grade of W.") In addition to advisor's signature, athletes must also get their advisor's signature and the signature of the athletic advisor, to drop or add any course after the 14th day of class. International students dropping any course must also get a signature from the Office of International Education.

After the last day to drop with a "W" grade, a student may drop a course(s) or withdraw from the university with a "W" grade only after having established the existence of unavoidable circumstances. A student can withdraw from the university (withdraw from "ALL" courses) until the last day of classes and receive "W" grades by contacting Office of the Registrar, Jere Whitson Building, Room 221 (registrar@tnech.edu).

A student who is officially registered in a course and who fails to attend a class will receive a grade of "NF." A grade of "NF" is treated the same as an "F" when calculating gpa. One who discontinues attendance without official withdrawal will receive a grade of "F" in the course.

A course is not officially removed from a student's schedule until a drop/add form is completed and returned to the Registration Center in Jere Whitson Building, Room 221. Drop/Add forms can be found at <https://www.tntech.edu/em/records/forms>

Official Enrollment. Credit will be granted only for courses that appear on the student's official academic record.

Freshman Orientation and Registration. All freshmen and new transfer students will meet for orientation and registration as shown in the University Online Calendar.

Freshman and Sophomore English. Students must register for the required courses in English for each consecutive semester enrolled, except the summer term, until the

requirement of ENGL 1010, ENGL 1020, and ENGL 2130, ENGL 2235 or ENGL 2330 is met. Once enrolled, the student may not drop ENGL 1010 or ENGL 1020.

American History. All undergraduate students, except those majoring in engineering, are required to earn 6 hours of American History (HIST 2010-HIST 2020) at Tennessee Technological University or to present acceptable college transfer credits. All undergraduate students, including engineering students, who have not completed one unit of American History at the high school level, or 6 hours of American History in previous college work, must satisfy this requirement. International undergraduate students must complete any additional ESL support coursework from FLS international or pass the English Placement Test prior to enrolling in American History. Other undergraduate students will satisfy the requirement as prescribed in the various curricula in the University Catalog.

Major Subject. Each student entering Tennessee Tech will select a major subject or field of interest. He or she is expected to complete the curriculum for the major subject and degree chosen, as outlined under the department in which the major is offered, following the requirements in the University catalog effective at the time he or she enters the chosen curriculum. A student who transfers to another institution and later returns to Tennessee Tech will follow the catalog in effect when he/she returns to the University.

The major subject may be changed by meeting with the new department of the major s/he wishes to declare. The change is initiated by the new department in Eagle Online, which both the student and former advisor will acknowledge. From there, the Change of Major is automated through the Office of the Registrar. For more information, visit: <https://www.tntech.edu/em/records>

Second Major. A student may qualify for an additional major or majors by the completion of all prescribed requirements in the specified additional curriculum or curricula.

STUDENT COURSE LOAD

Minimum Course Load. The minimum load for full-time attendance is 12 semester hours. In the summer 4 hours is considered the minimum full-time load per session. (See "Financial Aid" section below).

Normal, Maximum, and Probationary Course Loads. Sixteen to seventeen hours is the normal student load. The maximum credit load for a student in good standing is 20 hours for fall and spring semesters and 15 for summer. The maximum load for students on academic probation is 16 hours for fall and spring semesters and 10 for summer. Any load exceeding the above requires approval by the Major Department Chair and Dean of the College or School in which the student is majoring.

Probation Course Load. The maximum load for students on academic probation is 16 semester hours for fall and spring semesters, and 10 for summer, with the exception of seniors within two semesters of graduation, who may carry 18 if necessary. A student on probation may be advised to take a lower load and must observe the load requirement or violate the terms of his/her probation.

Late Registration Course Load. Those who register late may be required to reduce their load.

Financial Aid. Federal law defines full time for financial aid purposes as being registered for at least 12 semester hours

(excluding audit hours) for all semesters. Three-quarter time students include those who register for 9-11 semester hours, and half-time students include those who register for 6-8 semester hours. Students who drop below 6 credit hours during any semester (including summer) may have their financial aid deleted. Students who attend only one (1) summer session may have their financial aid reduced.

Please remember that you must attend class to be eligible for your financial aid. If YOU WITHDRAW from school, DROP HOURS, or just STOP going to class, you will probably have to REPAY some or all of the aid you received.

REPETITION OF COURSES

A student may repeat a course which was previously taken and received a final grade of C or lower. Students are permitted to repeat a course in which a grade of B or higher was earned only with the approval of the Provost and the Vice President of Enrollment Management and Career Placement. Forms should be submitted to the Registration Center, Jere Whitson Building Room 221.

Courses may be repeated with only the first attempt being replaced by the second attempt. Any successive attempts will count in the cumulative grade point average with the last attempt standing as the grade in the course and only the last attempt for that course fulfilling the graduation requirement. Courses used to complete the graduation requirement must have a passing grade. This means that you can have credit for a course only one time in the calculated earned hours which apply toward the degree.

Transfer students applying for admission into the University will have their quality point averages recomputed with regard to repeats; their admission and standing will be subject to the revised average.

All grades received for a course will remain on a student's transcript. A notation is added to indicate that the course has been repeated. The information showing the grade received when the course was repeated is given in the report for the semester during which the course was repeated.

Students may not repeat a course in which they have previously received the grade of "I" (Incomplete). Students must make arrangements with the professor who assigned the incomplete to finish the course during the academic year following the "I" grade.

Students receiving Veterans Educational Assistance benefits may not receive benefits for courses previously passed unless a higher minimum grade is required in the degree program.

MINIMUM CLASS

Normally, the University does not offer a course in the freshman and sophomore years for which fewer than twelve students register, or in the junior and senior years for which fewer than eight students register, or in graduate classes for which fewer than six students register; however, the University is not obligated to offer these courses even though the minimum enrollments are met. The same restrictions are effective for a minimum class in the summer term.

ATTENDANCE AND WITHDRAWAL

Class Attendance. A student is expected to attend each meeting of every class for which he/she is registered. Each instructor is responsible for explaining, in writing, the practice in the treatment of absences at the beginning of each course. Regular class attendance is a definite part of the total performance required for the satisfactory completion of any course, and an unsatisfactory attendance record may adversely affect the final grade recorded for the course. If the attendance record of a student becomes unsatisfactory, the instructor can record a last of date of attendance that can adversely affect Financial Aid, Scholarships, Veteran's Benefits and other types of assistance.

Unsatisfactory class attendance may result in the student receiving a grade of "F." A student who is unable to return to classes due to an emergency or serious accident should notify the Office of Student Affairs. A student who cannot avoid an absence from a class for any other reason is expected to assume the responsibility of explaining his absence to the instructor and for making arrangements to complete the work missed. Tardiness is recorded as an absence. Students may consider a class dismissed and leave the room without penalty if the instructor fails to appear within fifteen minutes. At the end of each period, a ten minute interval is allowed for changing classes.

WITHDRAWAL FROM THE INSTITUTION

1. Students who wish to withdraw from the University during a semester must submit a formal written application (including signature) to the Office of Registrar. If no administrative holds have been assigned to the student account, such as a disciplinary hold, student requesting to withdraw will receive a grade of "W" in all courses if an official signed withdrawal application is received by the Office of Registrar. The withdrawal application must be received before or on the last day of classes as specified in Tennessee Tech's official Administrative Calendar (<https://www.tntech.edu/mastercalendar>).
2. Students who do not timely submit a formal written application (including signature) to the Office of Registrar will receive a grade of F in each course for which they are registered. Applications for withdrawal will not be considered if received after the last day of classes as specified in Tennessee Tech's official Administrative Calendar (<https://www.tntech.edu/master-calendar>).
3. If a student withdraws from classes and receives a "W" grade, the student does not need to apply for readmission if he/she is attending the very next Fall or Spring semester. If the student is skipping a Fall or Spring semester, he/she must apply for readmission (no fee) and can do so the very same day.
4. If a student withdraws from all classes during the time period which the transcript will not reflect a W, he/she must apply for readmission (no fee) and can do so the very same day. Students withdrawing from summer term do not need to reapply if they plan to attend classes in the fall.

5. In the summer term, if a grade has been earned during any of the sessions, the withdrawal will be treated as a drop of a course rather than withdrawal so that the grade earned will not be voided by the withdrawal. If withdrawal/drop has been processed in the summer term and the student wishes to register for a later summer session, the student must go to the Office of Registrar.
6. The refund policies for the University can be found on the Bursar's web page (<http://www.tntech.edu/bursar>).

If you wish to withdraw you may do so by completing the withdrawal form below which should be submitted to the Office of the Registrar, Jere Whitson Building 221 (registrar@tntech.edu).

VETERANS BENEFITS

Eligibility for Deferment of Payment of Tuition and Fees by Certain Eligible Students Receiving U.S. Department of Veterans Affairs or Other Governmentally Funded Educational Assistance Benefits

Servicemembers, Veterans, and dependents of veterans who are eligible beneficiaries of U.S. Department of Veterans Affairs education benefits or other governmentally funded educational assistance, subject to the conditions and guidelines set forth in Tennessee Code Annotated 49-7-104 as amended, may elect, upon formal application, to defer payment of required tuition and fees until the final day of the term for which the deferment has been requested. Application for the deferment must be made no later than 14 days after the beginning of the term, and the amount of the deferment shall not exceed the total monetary benefits to be received for the term. Students who have been granted deferments are expected to make timely payments on their outstanding tuition and fees balance once education benefits are being delivered. Eligibility for such deferment shall terminate if the student fails to abide by any applicable rule or regulation, or to act in good faith in making timely payments. This notice is published pursuant to Public Chapter 279, Acts of 2003, effective July 1, 2003.

- Apply for VA Educational Benefits online at: www.gibill.va.gov/apply-for-benefits/application
- Review VA Education Handouts, Brochures, and Regulations at: www.gibill.va.gov/resources/student_handouts/

Once you have submitted your VA application online, please provide a copy of your application, your DD214 Member 4, and proof of College Fund or Kicker (if applicable) to the Office of the Registrar in Derryberry Hall, Room 128. A copy of your Certificate of Eligibility from U.S. Department of Veterans Affairs must also be submitted. Contact the Office of the Registrar for additional information.

Veterans Administration General Guidelines:

- VA will only pay for courses **required** in the degree you are seeking as listed in the university catalog degree requirements.
- You must have at least 12 hours of **required** courses in your major to get full veterans educational benefits.
- VA will only pay for repeating courses with failing grades, unless the TTU catalog specifically states that a certain grade is required. Also, VA will not pay for a

course if you have received equivalent course credit for that course from another institution.

- VA will not pay for auditing a course.
- You must attend your classes in order to receive Veterans Educational Benefits. If you stop attending a class, the instructor will report your last date of attendance. The Office of the Registrar will report that date to the VA. VA will adjust your benefits accordingly.

TRANSCRIPT OF ACADEMIC RECORDS

Students may obtain a transcript of his or her academic records by logging into their Eagle Online account; however, alumni with all attendance dates prior to Summer 1986 needing a transcript must be requested using the written request form. Financial obligations to the University must be fulfilled prior to release of a transcript copy. There is no charge for a transcript copy; however, any payments received will be used to support the Educational and General Operation of the University. Directions for ordering transcripts can be found at: <https://www.tntech.edu/em/records/transcripts/>

PRIVACY RIGHTS OF STUDENTS

On May 20, 1975, Tennessee Tech approved a statement of policy that includes provisions for the release of information about students and the rights of students and others to have access to Tech's education records. The complete policy statement of "Privacy Rights of Students" is available in the Office of the Registrar. Additionally, students are sent an annual notice of their Privacy Rights to their TTU student email. For more information, please visit: <https://www.tntech.edu/em/records/ferpa/>.

USE OF SOCIAL SECURITY NUMBERS

In accordance with the Privacy Act of 1974, applicants for admission and enrolled students are advised that the requested disclosure of their Social Security numbers is voluntary. Students are notified, however, that only the Social Security number may be used as an identifier for grants, loans, and other financial aid programs according to federal regulations. The student's Social Security number will not be disclosed to individuals or agencies outside Tennessee Technological University except in accordance with the institutional policy on student records.

STUDENT AFFAIRS AND ACTIVITIES

Tennessee Tech provides programs and services which support the students in their intellectual endeavors as well as in their total development. Student Affairs, through its agencies and activities, provides opportunities for students to realize their development potential as physical, emotional, intellectual, social, and spiritual persons. Student Affairs provides for students' welfare by being available to help them resolve problems which affect their personal well being or which impede their academic progress.

DEAN OF STUDENTS OFFICE

The purpose of the Dean of Students Office is to provide services and programs that enrich the quality of student life and that enhance and compliment the academic mission of Tennessee Technological University by:

- Providing leadership and administrative direction to the Office of Student Orientation and Student Success, and the Office of Judicial Affairs.
- Helping establish and enforce the community standards of the University.
- Responding to the concerns of students, faculty, staff, parents and the community pertaining to student life at the University.

The Dean of Students Office would be the best office for students to visit and receive personalized attention for any concerns they may have at the University.

COUNSELING CENTER

The Tennessee Tech Counseling Center provides a wide range of services designed to help students adjust to and succeed in the university environment. The Center's services include those intended to help students with educational, career, personal, and social concerns. Adjustment to college, stress management, interpersonal relationships, family issues, depression, anxiety, eating disorders, substance abuse, and self-esteem are among the various concerns that students discuss in counseling. In addition to individual counseling, the Center also offers group counseling, which provides students the opportunity to share and learn from others. Strict confidentiality is maintained in the counseling process.

The Counseling Center works with faculty, staff, and student groups within the university community to develop educational programs and projects. These outreach services include workshops that focus on specific issues such as relationships, stress management, test anxiety, study skills, and an array of other topics relevant to the university experience. The Counseling Center also administers a number of standardized tests including ACT, CLEP, MAT, and GRE (subject exam only).

The Counseling Center is located at 307 Roaden University Center. The phone number is (931) 372- 3331. Students can call the Counseling Center or check the Center's web site at www.tntech.edu/counsel/ for information regarding walk-in hours, scheduling appointments, workshops, or available groups.

DISABILITY SERVICES

The Office of Disability Services is designed to assist students with disabilities in their educational development and vocational outcomes. The program provides direct assistance in appropriate classroom accommodations, creation and maintenance of an accessible physical environment, access to technology equipment, and encouragement of independence.

Students with disabilities are urged to come by the Office of Disability Services in Room 112, Roaden University Center, to discuss their educational plans and special needs. Documentation of a disability by professionals is necessary in determining the level of assistance that might be useful.

EAGLE CARD OFFICE

The Eagle Card -- Each student receives the first Eagle Card (official TTU ID) free of charge. Eagle Cards may be replaced for a \$10 fee.

Eagle Cards are used to access Residential Life halls and the Fitness Center. Cards are encoded with meal plans and flex dollars (if purchased). Money may be deposited to use as a debit system in the following areas: University Bookstore, MarketPlace (Cafeteria), Starbucks, Swoops (Grill), Outtakes (McCord Hall), Café at The Perch (New Hall North), Crav-ns (The Perch in New Hall North), Grill Nation (New Hall North), Papa John's (New Hall North), Au Bon Pain (Volpe Library), Business Office, Health Services (Infirmary), and the Post Office.

The ID is also used for admission to student activities, athletic events, etc. Students must present this card upon request from any college official or be subject to disciplinary action.

MINORITY AFFAIRS

The Office of Minority Affairs provides personal, cultural, social and academic growth for students of color. We provide opportunities for all students of color to learn about their history, take pride in their heritage and explore their potential. We promote cultural awareness by providing an environment that embraces diversity. We serve as a cultural resource to the campus and the community through our programming and outreach programs.

Our office provides programs designed to encourage cultural awareness, as well as, educational opportunities outside the classroom. In addition, we provide tutoring, academic counseling and information on scholarships and internships.

Minority Affairs is located in the Leona Lusk Officer Black Cultural Center, which houses a computer lab, conference room and a library of African-American authors. It is a great place to meet new friends and become involved with student organizations.

ORIENTATION AND STUDENT SUCCESS OFFICE

The Orientation and Student Success Office facilitates the transition of new students into Tennessee Tech University. It prepares new students for Tennessee Tech's educational opportunities, and initiates the integration of new students into the intellectual, cultural, and social climate of Tennessee Tech.

The mission of the Office of Orientation and Student Success is committed to serving students and families by:

- Providing programs and services to assist the transition of new students into the intellectual, cultural, and social climate of Tennessee Tech.
- Exposing new students to the University's educational and extracurricular opportunities in order to foster personal growth.
- Educating parent and family members and establishing partnerships to support students' academic and personal success.
- Developing students as leaders who are engaged inside and outside of the academic community.

STUDENT HEALTH SERVICE

Tennessee Technological University has a student health service which provides medical services for minor illnesses or injuries for any student enrolled at the University on an appointment basis during hours of operation. The health service staff includes nurses, nurse practitioner, physician, and pharmacist who plan and implement care for students during daytime hours Monday through Friday. The only charge made to a student is for medications, treatments, supplies, or laboratory work.

The student is responsible for expenses incurred for ambulance service, calls at a local physician's office, emergency services, and other services provided at Cookeville Regional Medical Center.

You are required to submit a health history and official record of immunization prior to enrolling. These are proof of two measles, mumps and rubella (MMR) vaccines, proof of having the chicken pox disease, a positive titer, or proof of two varicella vaccines. Proof of a Tuberculosis skin test (or PPD) that has been done within 12 months of school enrollment is needed for international students. Certain programs may have additional requirements. It is recommended that students also have meningitis and hepatitis B vaccine.

MEDICAL INSURANCE

Health and accident insurance is available to each student upon his/her registration at Tennessee Tech. This insurance coverage is authorized and approved by the Tennessee Board of Regents. Coverage provides hospital, surgical, and in-hospital medical protection on a year-round basis beginning with the first day of fall registration and continuing until the first day of fall registration the following year. Students may enroll in the plan during registration or at any time during the year by picking up an application at the Health Services Office (Infirmary).

Two plans of coverage are available at reasonable rates. Optional maternity coverage is offered under both plans. Details concerning this insurance are available at the Student Health Service Office and during registration. Students are encouraged to participate in one of the insurance plans, as it supplements the above services offered by Student Health Services.

STUDENT ACTIVITIES

Students are encouraged to participate in those extracurricular activities which afford opportunities for the development of individual initiative or group leadership and cooperation. For the purpose of eligibility for participation in institutionally sponsored extracurricular activities, all students are considered to be in good academic standing as long as they achieve sufficient qualitative and quantitative academic progress to allow them to remain enrolled in the institution. (For additional information, see the Academic Retention Table.) Individual organizations or activities within the institution may have additional requirements for participation.

The Student Government Association (SGA). SGA is composed of all full-time undergraduate and graduate students enrolled at Tennessee Tech. Student Government is composed of executive, legislative, and judicial branches. The purposes of the SGA as stated in the constitution are: to promote student participation in the affairs of the University; to serve as a channel

for the expression of student opinion; to support student activities on this campus; and to encourage the development of student responsibility, character, leadership, and citizenship.

Campus Recreation. The office of Campus Recreation is designed to offer students an opportunity for wholesome and enjoyable recreation, for physical fitness, and for developing skills that have carryover values. The office of Campus Recreation is located in the Fitness Center facility across from the Hooper Eblen Center. The Fitness Center provides students the opportunity to meet their personal health and fitness needs. Health Promotions Programs provides free fitness evaluations and assistance with meeting fitness goals. Outdoor Adventure Programs coordinates outings for camping, hiking, rafting and more as well as offering rental of camping equipment. Intramurals offers a variety of sports for both men and women. For information on any of these programs, call 372-6212.

Campus Religious Life. The student religious organizations serve students through organized activities and events such as Bible study, worship services, coffee house discussions, dramatic productions, folk masses, choir concerts, evening devotionals, student retreats, social issue symposiums, and social activities. Some of these groups have student centers near the campus and invite all students to participate in the programs and events planned and carried out by the students.

Eagle. The student yearbook is edited by students. It is a CD summarizing the highlights of student activities each year.

Fraternities. Thirteen social fraternities are presently active on campus: Alpha Gamma Sigma, Alpha Phi Alpha, Kappa Alpha, Kappa Sigma, Omega Psi Phi, Phi Beta Sigma, Phi Delta Theta, Phi Gamma Delta, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi and Sigma Phi Epsilon, Tau Kappa Epsilon.

Homespun. Published annually by the English Department, *Homespun*, contains poetry, fiction, drama, essays, photography, and art by students and faculty. Staff members also gain practical experience in magazine layout and design.

Music Organizations. Students are encouraged to participate in the University music organizations. Credit is offered for participation in groups which are organized as classes (see course descriptions). Some of the major organizations are the Bryan Symphony Orchestra, University Orchestra, Concert Choir, Tech Chorale, Madrigal Singers, Women's Glee, Mastersingers, University Wind Ensemble, Symphony Band, Concert Band, Tech Troubadours and Trouveres, Tennessee Tech Golden Eagle Marching Band, Varsity Pep Band, and Golden Eagle Brass.

The Oracle. *The Oracle* is a weekly newspaper edited by students. This paper contains news items and articles pertaining to the activities of students, faculty, and alumni.

Residence Halls Association. The Tech Residence Halls Association, known as RHA, is the governing body for all students living in residence halls at Tennessee Tech. The purposes of the RHA are to work primarily for the welfare of all residence hall students, coordinate the activities, serve as a channel of student opinion, insure that students are aware of their responsibilities and constitutional rights, encourage the development of responsibility, character, leadership, scholarship, citizenship, and create a new spirit of unity and service.

Sororities. There are seven social sororities active on campus, including Alpha Delta Pi, Alpha Kappa Alpha, Delta

Gamma, Kappa Delta, Phi Mu, Delta Sigma Theta, and Zeta Phi Beta.

Tech Village Resident Association. The Tech Village Resident Association, known as the TVRA, is the governing body for all students living in the Tech Village apartments at Tennessee Tech. The purposes of the TVRA are: to be a medium of communication between the residents of Tech Village and the administration of Tennessee Tech, to be an instrument for the purpose of initiating action and for the recommendation of actions toward the improvement and enhancement of resident life, to create, develop and implement social activities for the benefit of the residents, and to be a collective agent in advocacy of the interests of the residents.

WTTU-FM. WTTU-FM, an educational broadcasting service of the University, began broadcasting in May 1972. Students are trained by WTTU staff members and serve in staff positions in news, music, sports, and other programming areas. The WTTU-FM management determines general operating policy in keeping with rules and regulations of the Federal Communications Commission. WTTU has an AP wire service. The 1850 watt station is operated solely by Tech students from 7 a.m. until 1 p.m. at 88.5 Mhz FM and 105 FM on the FNI Cable System. Located on the third floor of the University Center, the station consists of offices and studios.

Student Organizations. The University recognizes the role and scope of student organizations in order to make classroom learning relevant to the many interests of its students. Student organizations support the academic program by (1) providing opportunities for developing and using leadership skills, (2) furthering scholastic awareness, and (3) developing professional, social, and individual interests. There are approximately 220 student groups registered on campus, each with a distinctive and unique purpose and program of activities. The Office of Student Activities, Roader University Center 122, may be contacted with questions about current organizations or starting new organizations.

WHO'S WHO

Selections to Who's Who Among Students in American Colleges and Universities are made each fall semester from juniors, seniors and graduate students. The selections are based on excellence in scholarship, leadership and participation in extracurricular activities on campus, citizenship and service to the University, and promise of usefulness to business and society.

DISTINGUISHED MILITARY STUDENTS

Each year the Professor of Military Science, with the concurrence of the President of the University, is authorized to designate outstanding students of the Army ROTC Advanced Course as Distinguished Military Students. Selection of the students is based on aptitude for military service, high academic accomplishments, leadership ability, and moral character.

ALUMNI ASSOCIATION

The purpose of the Alumni Association is to promote the educational, social, and economic interests of Tennessee Technological University, its faculty, friends, current students and alumni. Graduates of Tennessee Technological University

(those receiving a degree) and those completing an approved pre-professional program are recognized as alumni.

The Director of Alumni Relations oversees the activities of the Alumni Association. The work of the Association is administered through the Office of Alumni Relations in conjunction with the Association's Advisory Board. The Alumni Advisory Board consists of alumni representatives appointed by the Director of Alumni Relations and the current Advisory Board. The Board includes representatives from all six colleges and from the Upper Cumberland, Nashville, Knoxville, Tri-Cities, Atlanta, and Huntsville, Alabama areas. Class years of board members range from the early 50's thru the late 90's.

CAREER DEVELOPMENT

The Office of Career Development, located on the third floor of the Roader University Center, provides a variety of career resources for students and alumni. **Freshmen** and **sophomores** are encouraged to complete one or more career assessment programs to assist in determining their major course of study and to examine potential employment opportunities within various professions. Full-time students who have reached sophomore status and have achieved a 2.5 overall GPA are eligible to participate in the **Cooperative Education Program**. Program participants obtain on-the-job learning experiences that can provide a realistic evaluation of a career choice along with giving them the opportunity to earn a supplemental income to aid with college expenses.

Recognizing the benefits to be gained through the use of cutting-edge technology, Career Development maintains a full service web site at (www.tntech.edu/career). Students, alumni, and employers may access information about campus recruiting activities via this website. Internet "weblinks" have been set up as a quick resource tool to use when searching the Internet for career resources and job opportunities.

As the university's centralized recruiting facility, students reaching **senior status** should register with the office for assistance with their job search. Advice and suggestions to maximize interviewing strategies and resume preparation are also provided. Registration is required for students and alumni to participate in on campus interview activities. Registration is free for all students and alumni.

MOTOR VEHICLES

All students are permitted to maintain vehicles on the campus, subject to the approval of the University. Registration of motor vehicles is required beginning with the fall semester and continuing throughout the entire year. All vehicles operated on campus by full-time, part-time, or night-time students must be registered. Vehicles will be issued permits for specific parking areas, and compliance with all rules and regulations is required. Parking restrictions are effective in parking lots from 7:45 a.m. until 4:30 p.m., Monday through Friday each day that university offices are officially open, except east dorms where 60-minute parking is in effect daily from 7:30 AM until midnight. For information regarding University Police and Parking and Traffic Regulations, refer to the TTU police website at www.tntech.edu/police.

NATIONAL ORGANIZATION HEADQUARTERS

The University is honored to have the Pi Tau Sigma National Headquarters and the Omega Phi Alpha National Office on campus. They are located in Prescott Hall and Jobe Hall, respectively.

DRUG FREE CAMPUS POLICY

The Tennessee Technological University community (Faculty, Staff and Students) complies with the policies and penalties relative to controlled substances (illicit drugs) and alcohol, as required by the Drug Free Workplace Act of 1988 and the Drug Free Schools and Communities Act Amendments of 1989. As an employee and/or student at Tennessee Technological University, you are required to be knowledgeable of and comply with the Drug Free Campus/Workplace Policy, the applicable provisions of which are summarized below: It is the policy of this institution that the unlawful manufacture, distribution, possession, use or abuse of alcohol and/or illicit drugs on the Tennessee Technological University campus or on property owned or controlled by the University is strictly prohibited. All categories of employees and students are subject to this policy and to applicable federal, state and local laws related to this matter. Additionally, any violation of this policy will result in disciplinary actions as set forth in the applicable sections of this policy.

STUDENT COMPLAINT PROCEDURES

Whenever possible, students are encouraged to seek an informal resolution of the matter directly with the faculty or other individual(s) involved. However, if an informal approach is neither successful nor advisable, the student may file a formal written complaint. You may review the complete policy document by clicking here.

1. A student complaint form should be submitted "online" to the Dean of Students office. It should contain (at a minimum) the student's name and official TTU email address, the date of the alleged conflict or action, a summary of the complaint, a list of other persons who may provide information and any appropriate documentation. The student must also include the resolution or outcome he or she is seeking. The complaint must be submitted within ten (10) business days of the event giving rise to the complaint.
2. Within five (5) business days of receiving the complaint, absent good cause, a conference will take place with the student and a staff member from the Dean of Students office.
3. The student must submit all relevant documentation within ten (10) business days of the date the student files the complaint.
4. The staff member will notify appropriate persons and request any information or further documentation needed to resolve the complaint.
5. The staff member may attempt to resolve the complaint by encouraging discussion between the student(s) and other students or third party members of the university community, or by taking the appropriate action to resolve the complaint.

6. A review of the complaint with the supervisor(s) or others in the line of supervision of third parties, if applicable, may be used when deemed appropriate and beneficial to the process.
7. Absent good cause, the staff member assigned to the complaint will file a final written resolution or a finding of "unresolved" in the Dean of Students office within fifteen (15) business days of the date the student submits the relevant documentation. If there are circumstances requiring an extension of this deadline, the staff member assigned to the complaint will notify the parties involved.
8. If the student is not satisfied with the outcome of the complaint, the student may appeal the outcome within five (5) business days of receiving the final written resolution or finding of "unresolved." The student must file with the Dean of Students a written request for an appeal committee review.
9. The appeal committee will consist of five representatives who will serve a one-year term. These representatives will comprise: two student members appointed by the SGA president; one member appointed by the Vice President for Academic Affairs; one member appointed by the Vice President for Student Affairs; one member appointed by the Vice President for Planning and Finance.
10. Absent good cause, the appeal committee will issue a final written decision within twenty (20) business days of the date the student submits an appeal. If there are circumstances requiring an extension of this deadline, the chair of the committee will notify the parties involved. The committee's decision will be final.

Please click "Student Complaint Form" to submit a complaint.

STUDENT RESPONSIBILITY

All students are required to have knowledge of rights, responsibilities and regulations pertaining to campus life which are published in the *Student Handbook*, www.tntech.edu/studenthandbook/

Each student is responsible for maintaining communication with the University by keeping officials informed at all times of current address (including zip code) and telephone number.

Students are responsible for the proper completion of their academic programs; for familiarity with requirements of the University Catalog under which they intend to graduate; for maintaining the grade average required; and for meeting all other degree requirements. A student may receive counsel from an academic advisor; however, the final responsibility remains that of the student.

JUDICIARY PROCEDURES

Judiciary procedures at the University do not constitute legal actions, and the decisions are not to be equated with verdicts reached by courts of law. These procedures simply involve the fact-finding and decision-making processes of an educational institution.

Detailed procedures for the disciplinary system are printed in the "Disciplinary System Manual." Copies of the manual are located in the Dean of Students Office.

RESIDENTIAL LIFE

The Office of Residential Life realizes the impact that living arrangements can create on a student's life and education. We feel the decision to live in University housing, while attending college, will provide additional opportunities; for personal growth, educational development, connectedness, and leadership experiences. Studies consistently show that students living in the residence halls have higher grade point averages and lower dropout rates and are involved in more campus activities than those living at home or off campus.

TTU campus has 15 residence halls, two for men, one for women and 12 coeducational halls accommodating approximately 2,300 students. Each residence hall is supported by an Assistant Coordinator, a live in professional staff member, a Hall Director, an experienced student staff member providing additional support to the hall, and between 9 and 12 Resident Assistants (RAs), upper class students hired to provide support, guidance and community development on each of the floors. Each residence hall is secured by entry through an electronic card access with only assigned residents and staff being allowed entrance.

Crawford Hall	Crawford Village – all female	Browning/Evins Halls	Men's Village – all male
Maddux/McCord Halls	Engineering Village – coed	Cooper/Dunn Halls	coed
MS Cooper/Pinkerton Halls	Global Village – coed	Ellington/Warf Halls	Arts & Media Village – coed
Jobe Hall	Business Specialty Hall – coed		
Murphy Hall	Honors Specialty Hall – coed		
New Hall North	The Tree House – Environmental Village – coed		
New Hall South	The Service Station – Service Village – coed		

Living-Learning Villages

The Village concept was conceived to create smaller, more personal groups within the larger university, to enhance student-faculty interaction beyond the classroom and to enhance positive student connections within the University. Each Village will be organized around a common theme and supported by a Faculty Head working together with the Assistant Coordinator, the Residential Life staff and the Village residents.

- The Tree House -- Environmental Village, New Hall North, Established Fall 2010
- The Service Station -- Service Village, New Hall South, Established Fall 2010

- Women's Village -- Crawford Hall, Established Fall 2011
- Engineering Village -- Maddux McCord Hall, Established Fall 2011
- Arts & Media Village -- Ellington/Warf Hall, Established Fall 2012
- Global Village -- MS Cooper/Pinkerton Hall, New Fall 2013
- Men's Village--Browning/Evins Hall, New Fall 2013
- Entrepreneurial Village--Jobe/Murphy, New Fall 2013
- Health and Wellness--Cooper/Dunn, New Fall 2013

New Hall North. "Treehouse" Environmental Village. A beautiful co-ed facility, newly opened fall 2010 - housing 238 co-ed residents. New Hall North offers both double and single rooms with private baths. Additional amenities include: a great room for residents to gather on each floor, laundry rooms on each of the upper floors, as well as three study rooms centrally located within the hall. Also housed in New Hall North is the Environmental Village, including the Faculty Head office. As a part of the "Treehouse" there are a number of activities and programs scheduled throughout the academic year supporting environmental issues and additional opportunities for interaction and connection to the campus community.

Attached to New Hall North is the sorority wing; housing chapter rooms for four campus sororities, "The Perch" (pizza and grill) and convenience store, a recreation area - both located on the first floor, as well as a multipurpose/classroom located on the second floor.

New Hall North is available to all students with selected rooms held for new, incoming freshman residents.

New Hall South. "The Service Station" Service Village. The companion to New Hall North, housing 358 co-ed residents, offers double rooms with private bathrooms. Additional amenities include: an atrium lounge that includes a large screen television and a ping pong table, four study rooms located throughout the hall as well as a multimedia classroom on the fourth floor. Also housed in New Hall South is the Service Village including the Faculty Head office. As a part of "The Service Station" there are a number of activities and programs scheduled throughout the academic year supporting service opportunities and additional chances for interaction and connection to the campus community. New Hall South is available to all students with selected rooms held for new, incoming freshman residents.

Maddux/McCord Hall. Engineering Village. Maddux/McCord Hall is a traditional hall, housing 239 co-ed residents, that offers additional support for engineering students; 5 student engineering coordinators, hired especially to provide direct academic support for engineering students, as well as a computer lab specially equipped with engineering programs, as well as study lounges. Also housed in Maddux/McCord is the Faculty Head office for the Engineering Village. As a part of the Engineering Village there will be a number of activities and programs scheduled throughout the academic year geared towards students taking engineering classes.

Crawford Hall. Women's Village. A traditional hall located just across from the Nursing & Health Services Building, housing 219 women residents. In addition to the normal traditional hall amenities, also housed in Crawford Hall is the Faculty Head office, study rooms and a classroom for the Women's Village. As

a part of the Women's Village program there will be a number of activities and events scheduled throughout the academic year selected to support women on a college campus.

Ellington/Warf Hall. Arts & Media Village. Ellington/Warf is a traditional hall, housing 200 co-ed residents. This Village invites residents interested in visual, literary and performing arts including music, theater, film, and digital/online media and communication. Share your passion in one or more of these areas with fellow residents, even if you are majoring in something other than the arts or humanities. Located in the Arts & Media Village will be a "Village suite" located on the 1st floor of Warf Hall and will include; a classroom, study area, lounge and Faculty Head Office. Ellington/Warf has also completed a total renovation project. Re-opening for the fall 2014 new amenities will including all new; furniture, HVAC, doors, flooring, paint, hallway carpet and updated lounge and bathrooms.

MS Cooper/Pinkerton Hall. Global Village. MS Cooper/Pinkerton is a traditional hall, housing 170 co-ed residents. The Global Village will cater to residents that wish to live in a global environment that includes students from all over the world. American and international students will be paired up to live together as roommates as well as having the opportunity to participate programs and activities designed to enhance this international environment. The Global Village will also be utilized as our break and summer hall, to accommodate residents that need a place to live over the university breaks. **MSC/P has also completed a total renovation project. Re-opening for the fall 2013 new amenities will including all new; furniture, HVAC, doors, flooring, paint, hallway carpet and updated lounge & bathrooms.**

Browning/Evins Hall. Men's Village. A traditional hall located just across from the STEM Center, housing 258 men. In addition to the normal traditional hall amenities, also housed in Browning/Evins Hall is the Faculty Head office, study rooms and a classroom for the Men's Village. As a part of the Men's Village program there will be a number of activities and events scheduled throughout the academic year geared to men on a college campus, all designed to enhance and encourage additional positive campus connections.

Specialty Housing. In addition to our Living Learning Villages we also have 2 specialty housing areas: Honors Program located in Murphy Hall. Jobe Hall provides support for business majors. In specialty housing, the Residential Life staff along with program mentors will provide opportunities for students to assist one another, both academically and personally. Activities include faculty involvement programs, study groups, technology resources and academic support programs. These specialty areas are anticipated to become the Entrepreneurial Village, fall 2015. Jobe/Murphy is also scheduled for the next total renovation project. Scheduled for fall 2015 new amenities will including all new; furniture, HVAC, doors, flooring, paint, hallway carpet and updated lounge and bathrooms.

Tech Village Apartments. There are 300 Tech Village apartments for the following student groups; sophomores, juniors, seniors, 21 years or older, married, single with children, graduate, and faculty/staff. Fall 2011 the 1st phase of our apartment renovation project was completed with the 2nd of three phases opening in the fall of 2013 (all apartments will be totally renovated at about 80-90 apartments per year).

Additional benefits of Campus Living. Each residence hall may vary somewhat in the amenities offered, but they all

include cable, local phone service, "free" laundry, and RESNET (internet service). All are tobacco free. To view the amenities chart or to apply for campus housing visit our web site at www.tntech.edu/reslife. The web site is full of information, including the campus housing handbook, Guide for Successful Living and a Frequently Asked Questions section. However, if you still find yourself in need of additional information, you can contact us at either reslife@tntech.edu or (931) 372-3414.

If you are interested in living in one of the Villages or any of the other halls, you may make your request on the housing application, on line at: www.tntech.edu/reslife/applications/.

FINANCIAL AID

The Office of Financial Aid at Tennessee Technological University (OFA) is committed to helping students achieve their educational goals in accordance with federal, state, and institutional policies. The following pages explain ways in which the OFA ensures compliance. We welcome all interested parties to view this catalog and are interested in feedback you have regarding its contents or presentation. You may provide such feedback at financialaid@tntech.edu Subject Line: 2017/18 Catalog Feedback.

Philosophy of Student Financial Aid and the OFA

The primary purpose of student aid is to provide financial resources to students who would otherwise be unable to pursue post-secondary education. To accomplish this stated purpose, the following is an outline of the Philosophy of the TTU Financial Aid Office.

- We will make every effort to meet the demonstrated needs of all students at TTU to the extent funding will permit in an ethical manner.
- We will award all aid on the basis of demonstrated financial need except where funds are specified for recognition of special talents.
- We will exercise adequate controls to insure that need-based awards do not exceed the documented need.
- We must recognize that the primary responsibility for financing post-secondary education rests with the student and his/her family. Financial assistance from TTU and other sources is only intended as supplementary to the efforts of the family.
- We will help students seek, obtain, and make the best use of all financial resources available.
- We will provide consumer information in a clear concise manner describing all Direct and Indirect costs.
- We will inform students of all conditions under which an award is granted at the time the offered award is made.
- We will refrain from and discourage others from making any public announcement of the amount or the type of financial aid awarded a student in order to protect the confidentiality of the economic circumstances of the student and his/her family.
- We will respect the confidentiality of student records. Information will be released only with the written or electronic consent of the student and/or his/her family.

- We will never administer aid to accomplish disciplinary objectives.

The OFA Principles of Financial Aid

The Financial Aid Office staff at Tennessee Tech University has adopted the following principles of student financial aid administration:

- The purpose of any financial aid program - institutional, governmental, or private - should be to provide monetary assistance to students who can benefit from further education but who cannot do so without such assistance. The primary purpose of a collegiate financial aid program should be to provide financial assistance to accepted students who, without such aid, would be unable to attend that University.
- Each University has an obligation to assist in realizing the national goal of equality of educational opportunity. The University, therefore, should work with schools, community groups, and other educational institutions in support of this goal.
- The University should publish budgets that state total student expenses realistically by including, where applicable, maintenance at home, commuting expenses, personal expenses, and necessary travel.
- Parents are expected to contribute according to their means, taking into account their income, assets, number of dependents, and other relevant information. Students themselves are expected to contribute from their own assets and earnings, including appropriate borrowing against future earnings.
- Financial aid should be offered only after determination that the resources of the family are insufficient to meet the student's educational expenses. The amount of aid offered should not exceed the amount needed to meet the difference between the student's total educational expenses and the family's resources.
- The amount and type of self-help expected from students should be related to the circumstances of the individual. In the assignment of funds to those students designated to receive financial aid, the largest amounts of total grant assistance should go to students with the least ability to pay.
- The University should review its financial assistance awards annually and adjust them, if necessary to reflect changes in the financial needs of students and the expenses of attending the institution. The University has an obligation to inform students and parents of the financial aid renewal policies for enrolled students at the time of the initial offer of financial assistance.
- Because the amount of financial assistance awarded reflects the economic circumstances of students and their families, the University should refrain from any public announcement of the amount of aid offered and encourage students, their secondary schools, and others to respect the confidentiality of this information.
- All documents, correspondence, and conversations between and among aid applicants, their families, and financial aid officers are confidential and entitled to the

protection ordinarily arising from a counseling relationship.

- Concern for the student should be paramount. Financial aid should be administered in such a manner that other interests, important though they may be, are subordinate to the needs of students.

Tennessee Tech University Policy & Procedure Manual

In order to remain compliant on all federal, state and institutional guidelines the OFA publishes a secondary publication, The OFA Policies & Procedures Manual. The P/P Manual may be reviewed on request from the OFA.

The Director of Financial Aid is responsible for compliance with Federal, State and Institutional Policies. The Policies and Procedures manual will be updated on a rolling basis. As policy decisions are changed and new processes become part of daily office functions, this manual will be updated as necessary. It is the responsibility of each staff member to report changes in his or area to ensure the accuracy of this manual.

Often members from other offices on campus will be affected by changes in policy or procedure within OFA. When this is the case, all affected staff will meet to discuss the best recourse of action and implantation of new policies and procedures. When necessary, policy and procedural changes will be routed to other offices for approval.

Financial Aid Processed

Tennessee Tech University invests substantial funds in institutional financial assistance to help make it possible for students who are admitted to the University to attend. Currently, approximately 79% of Tech students who applied for need based aid receive some form of federal, state, institutional, or outside financial assistance need-based assistance, with total assistance amounting to over \$93,000,000.

Most aid awarded by the University is offered as a combination of grant, loan and student employment. Tech takes full advantage of the available federal and state financial assistance programs when awarding financial aid to students. Additionally, through the generosity of loyal alumni and other friends of the University, Tech students benefit from a generous competitive scholarship program.

Definitions

COA: Cost of Attendance (tuition, fees, room, and board, estimated cost of books, estimated personal/living costs and estimated transportation costs). The term "Direct COA" only includes tuition, fees, and estimated costs for books and supplies. Room and board are included as "Direct COA" only for students who reside at or have purchased a meal plan through Tennessee Tech University.

EFC: Expected Family Contribution; the minimum amount a family is expected to contribute for the student's education for a given academic year. The EFC is calculated by the FAFSA and assumes families will finance education utilizing current income, past savings, and student and/or parental borrowing.

Demonstrated Need: The difference between the COA and the EFC.

FAFSA: Free Application for Federal Student Aid; used in awarding federal and state grants and scholarships as well as loans and student employment.

SAP: Satisfactory Academic Progress: federal and institutional requirement that students must consistently progress toward completion of degree requirements; includes GPA and earned hours measured at the end of each academic year.

Financial aid APPLICATION PROCEDURES for prospective students

- Submit the FAFSA (www.fafsa.ed.gov) between October 1, 2016 and June 30, 2018.
- The Title IV Code for Tech to receive the FAFSA results is 003523.
- All prospective students who want consideration for financial assistance must complete the FAFSA. This includes anyone wanting consideration for the State Lottery Scholarship Program.
- Notification of financial aid awards for admitted applicants will occur by mid-March, with admitted.
- Students accept or decline financial aid awards via their Eagle Online account.

Financial aid APPLICATION PROCEDURES for currently enrolled/returning students

Currently enrolled/returning students who wish to continue eligibility for need-based financial aid (and for the Tennessee Education Lottery Scholarships for Tennessee residents) must complete the FAFSA each year. Tech encourages students to complete the FAFSA as soon as possible between October 1, 2016 and June 30, 2018. Returning Tennessee students who qualified for the State grant (TSAA) in previous years must complete the FAFSA by March 1 to be considered for renewal. The Department of Education will send renewal notices to students in October of each year via email.

Financial Aid Awards

If the results of the FAFSA reveal that a student has a financial need, Tech will normally offer the student a financial aid award that consists of gift aid (federal and state grants) and self-help (loans and student employment). Institutional funds, federal funds, state funds and funds provided to the student through outside organizations are all considered a part of the need-based financial aid package and are applied to need first, per federal regulations. The need-based programs commonly available at Tech are described here:

Grants

Federal Pell Grant (PELL): The federal government provides direct assistance to eligible students through the Federal Pell Grant Program. Eligibility for the Federal Pell Grant is determined by the results of the FAFSA. The maximum EFC to receive a Pell Grant is 5328.

Federal Supplemental Educational Opportunity Grant (SEOG): Federal Supplemental Educational Opportunity Grants are awarded by Tech to students with exceptional financial need, defined as those students who are eligible for Pell Grant.

SEOG funds are limited and are awarded until funds are exhausted.

Tennessee Student Assistance Award (TSAA): Students who are residents of Tennessee apply for the TSAA via the FAFSA. To be eligible, a student must have graduated from a Tennessee high school, have been a continuous resident of Tennessee for the twelve-month period preceding the start of the academic year for which the grant is made, and have an EFC of \$2100 and below (subject to change per state funding).

Returning students wishing to renew the award must complete the FAFSA before March 1st to remain eligible. Further information may be obtained from the Tennessee Student Assistance Corporation, Suite 1950, Parkway Towers, 404 James Robertson Parkway, Nashville, TN 37243-0820. The phone number is (800) 342-1663 or (615) 741-1346. The web site is www.TN.gov/collegepays. The state of Tennessee is the final authority on eligibility for the program. Tech is not responsible for replacing lost state grant funding.

Tennessee Education Lottery Scholarship Program (HOPE): The state of Tennessee offers scholarships of up to \$8,250 (\$2250 per Fall, Spring and Summer and maximum supplemental award is \$1500) for Tennessee residents who attend an approved college or university in Tennessee. The FAFSA is the application for the TELS funding and must be completed by state-established deadlines, as indicated on FAFSA on the Web at www.fafsa.gov. Information on all requirements for the TELS may be found at www.TN.gov/collegepaystn.com. The state of Tennessee is the final authority on eligibility for the program. Tech is not responsible for replacing lost state grant funding.

Loans

Federal Perkins Loan (PERK): Tech awards Federal Perkins Loans to students who demonstrate exceptional financial need. The Perkins Loan is a 5% interest loan on which the interest is subsidized while in school no payments are required to be made as long as the student is enrolled at Tech for at least 6 credit hours. Repayment begins nine months after the student ceases being at least a half-time student (6 credit hours). Repayment of the Perkins Loan may extend over a 10-year period. Perkins funds are limited and loan amounts may vary from year to year.

Federal Direct Student Loan Program (DIRSUB and DIRUNS): These federal loans up to \$3,500 are available to first-year undergraduate students. Upon earning 30 credits, students may obtain loans up to \$4,500 for the sophomore year, and, upon earning 60 credits, students may obtain loans of up to \$5,500 per year for the remaining years of undergraduate study. Students may request an additional \$2,000 per year in unsubsidized loan funds.

Student Employment

Student employment at Tech is the Federal Work Study Employment Program. When an offer of student employment of any type is extended by the University and accepted by the student, this offer does not guarantee that the student will earn the full amount of the award. The student will be paid only for the hours worked, and the award amount represents maximum gross wages a student may earn. Earnings are paid directly to the student; they are not credited to the student's account in the

Bursar's Office. To receive a paycheck, a student employee must have an I-9 form and a W-4 form on file in the Human Resources Office.

Federal Work Study Employment Program (FWS): Through the Federal Student Employment Program, part-time employment is offered to students to help them meet their financial need. A student may earn no less than the prevailing minimum wage rate for an average of ten (10) hours per week while enrolled as a regular student during the academic year.

Withdrawal from Tech and Return of Funds

Return of Federal Title IV Student Aid: When a student who has Federal Title IV student aid withdraws from the University or does not return from an approved leave of absence, or takes an approved leave of absence for longer than 180 calendar days (including summer), the unearned portion of those funds must be returned to the federal student aid programs. Federal Title IV funds that may have to be returned include the Federal Pell Grant, the Federal Direct Loan, the Federal Direct Parent Loan for Undergraduate Students (PLUS), the Federal Perkins Loan and the Federal Supplemental Educational Opportunity Grant (SEOG). The unearned portion of Federal Title IV funds is determined by dividing the number of days in the term that have passed as of the date of withdrawal (last date of class attendance) by the total number of days in the term. If the withdrawal occurs after 60% of the term has elapsed, no return of Title IV funds is required. The Office of Financial Aid calculates the Return of Title IV funds amount and informs the Bursar's Office of the results of the calculation.

Federal regulations require funds be returned to federal programs in the following order: Unsubsidized Federal Direct Loans, Subsidized Federal Direct Loans, Federal Perkins Loans, and Federal Direct PLUS Loans. If funds remain after repaying all loan amounts, the remaining funds are repaid to Federal Pell Grants and Federal Supplemental Educational Opportunity Grants (SEOG).

Return of State and Institutional Student Aid: When a student who has state and/or institutional student aid withdraws from the University or does not return from an approved leave of absence, or takes an approved leave of absence for longer than 180 calendar days (including summer), the University returns the unearned portion of those funds to the state and/or the University.

Student Financial Responsibility: Students and parents should be aware that the requirement to return Federal Title IV assistance and the policy to return state and institutional aid might result in a balance due to Tennessee Tech University; the student and/or student's family is responsible for paying any balance resulting from the return of Title IV aid and state and institutional funds.

Scholarships

Financial need is not a consideration in awarding scholarships at Tech, with the exception of a number of scholarships whose donors require it. Federal regulations, however, do require that any assistance, including competitive scholarships, first apply towards the demonstrated need when awarding need-based aid.

All qualified applicants are considered for Tech's competitive scholarships, if they complete the Institutional Application by the posted priority date of December 15 of the preceding year.

Satisfactory Academic Progress

Federal regulations require the Office of Financial Aid at Tennessee Tech University to establish and apply reasonable standards of satisfactory academic progress for the purpose of the receipt of financial assistance under the programs authorized by Title IV of the Higher Education Act. The law requires institutions to develop policies regarding satisfactory academic progress (SAP). Each institution must design criteria which outlines the definition of student progress towards a degree and the consequences to the student if progress is not achieved. TTU students who wish to be considered for financial aid must maintain satisfactory academic progress in their selected course of study as set forth in this policy.

Tennessee Tech University Policy

The Office of Financial Aid evaluates student academic progress at the end of each Spring Semester for continuing students who have submitted a FAFSA for the new year and weekly thereafter as new FAFSA's arrive. Students with transfer hours will be reevaluated as the Institution records those hours on the student's transcript. Students are evaluated on the basis of three criteria: 1) grade point average (GPA.), 2) pace (PTERM), and 3) maximum time frame limitation (MAXHRS).

Please note that for SAP purposes, the Federal government requires that Tennessee Tech University use coursework completed at Tennessee Tech University in addition to transfer hours/courses that apply to your degree as outlined in your Academic Plan. Also, the Academic Fresh Start program is an institutional policy that is NOT considered for federal aid policy.

Criteria One – Qualitative - Cumulative Grade Point Average (GPA)

To receive financial aid, a student must maintain a minimum qualitative measure of progress defined as cumulative G.P.A. as listed below:

1. Freshmen must have a minimum cumulative GPA of at least 1.6
2. Sophomores must have a minimum cumulative GPA of at least 1.8
3. Juniors must have a minimum cumulative GPA of at least 2.0
4. Seniors must have a minimum cumulative GPA of at least 2.0
5. Graduate Students must have a minimum cumulative GPA of at least 2.0

Criteria Two: Pace (PTERM)

In order to maintain financial aid eligibility, all students are required to complete 67% of the total credit hours attempted.

How to calculate PACE

Cumulative number of credit hours earned
Cumulative number of credit hours attempted

Criteria 3: Maximum Time Frame (MAXHRS)

Undergraduate students at Tennessee Tech University may attempt a maximum of 180 credit hours.

Additional requirements for renewal of federal (Title IV), state, and institutional aid, including Federal PLUS:

- Students must be enrolled at least half-time (6 credits) in order to be eligible for any Title IV (except Pell Grant) or state assistance.
- Grades and cumulative earned credits are reviewed at the end of each academic year for all students, unless stated otherwise by the Director of Financial Aid.

Definitions and regulations concerning full-time student status, course schedule changes, unauthorized withdrawal from class, and removal of conditional grades are stated in other sections of the University Catalogue.

Students with Disabilities

Students with disabilities who are taking a reduced course load and who have received approval of full-time status will not be denied consideration for financial aid. The amount of aid awarded, however, will be reduced to the proportionate amount that corresponds with the student's course load. For example, a minimum of twelve (12) credits per semester is required to receive student aid as a full-time student. If a student has received approval from the Disability Support Committee to be considered a full-time student for a course load of eight (8) credits in a given semester, the Tech-funded aid will be reduced to 2/3 of the amount it would have been if the student were taking twelve (12) or more credits. A course load of six (6) credits will always be considered to be half-time. No Tech-funded aid will be available to any student who is enrolled less than half-time.

Revision of Financial Aid Awards

Financial aid is dynamic and may change as new information becomes available to the Tech Office of Financial Aid. Any financial aid package is subject to revision (even during the academic year) for any of the following reasons:

- In the process of verifying the information the student/parent reported on the need analysis form(s) (FAFSA), an error is discovered which, when corrected, changes the student's eligibility.
- A change in regulations governing federal or state programs occurs and requires an adjustment to be made.
- Funding levels in federal or state programs are reduced.
- The student receives additional financial assistance, including, but not limited to, outside scholarships, from a source not listed on the most recent award notification or on the Eagle Online.
- The student fails to meet satisfactory academic progress standards for renewal of financial aid.
- The Financial Aid Office discovers any error, clerical or other, on an award.
- The student fails to complete required financial aid applications for need-based federal, state and institutional aid, including any documents required for verification of FAFSA information.

Please note that any aid reduced based on the above will not be replaced by Tech-funded grant.

Financial Aid for Study Abroad

Tech students enrolled in study abroad programs administered (sponsored) by Tech are eligible for competitive-based and need-based financial aid on the following basis:

- The total cost of such a program will be defined as tuition, participation fee (if any), an allowance for round trip airfare, a reasonable allowance for ground transportation in the foreign country, an allowance for room and board, books and required supplies and an allowance for incidental personal expenses. The student must report these costs to the Financial Aid Office via a Consortium Agreement.
- The expected family contribution will be calculated using the results of the FAFSA.
- All forms of financial aid for which the student would normally qualify will be applicable, such as campus-based Title IV and other Title IV funds, as well as any outside loans or scholarships the student might have.
- In cases where the total cost of the study abroad program is less than the total cost of a semester at Tech (as a resident student), the financial aid package will be based on the cost of the study abroad program.
- Tech students receiving financial assistance from the University who choose to participate in one of our exchange programs are considered to be Tech students. The financial aid awarded to the student to meet the costs of the exchange program are considered expended for the original length of the program. In other words, a student who elects to participate in a one year exchange program is considered to have been awarded two semesters of aid. If the student decides not to complete the full year of the program, the student should realize that two semesters of aid have been used, even though the entire program was not completed.

The above policies apply to study abroad programs that occur during the fall, spring and summer semesters of the academic year.

Students using federal or state aid for study abroad programs must complete a Consortium Agreement as described in the literature from the Study Abroad Office on campus.

Transfer Students

A student transferring to Tech who is seeking financial assistance must submit an accurately completed FAFSA (www.fafsa.gov) as early as possible in order to determine financial need for the upcoming year.

A transfer student shall be eligible for all forms of financial aid:

1. the student's previous college academic record is commensurate with the requirements for the award;
2. Had the student entered Tech during the first year in college, such an award would have been awarded.

NOTE: The number of semesters for which a transfer student may receive Tech-funded aid is based on the classification of the student upon enrollment. For example, if a transfer student enrolls at Tech as a sophomore, that student may receive aid for a total of six (6) semesters. A student enrolling as a junior may receive of four semesters, and so forth.

Additional Policies

- The main method of communication from the Financial Aid Office is to the student, via the student's Tech-assigned email address. Students must communicate with parents concerning financial aid award information, requirements, etc.
- Most information about the student's financial aid award(s), requirements for completing the financial aid process, costs of attendance, etc. may be found on Eagle Online. The Financial Aid Office does not mail paper award letters or "missing documents" letters home to Tech students.
- The total amount of Tech gift aid (scholarships, fellowships and/or grants) a student is eligible to receive may not exceed our direct cost of attendance (tuition, fees, room, and/or board). If the total amount of Tech-funded gift aid exceeds the direct cost of attendance, a portion of the Tech gift aid will be reduced accordingly.
- A student may not receive gift aid (scholarships, fellowships and/or grants) from all sources (Tech, federal, state, private) in excess of the total cost of attendance at Tech (tuition, fees, room, board as well as an estimated allowance for books, transportation, and personal/living expenses). If the total amount of gift aid from all sources exceeds the total cost of attendance, Tech gift aid (scholarships, fellowships, and/or grants) will be reduced accordingly.
- All outside financial assistance or scholarships received by a student attending Tech must be reported to the Financial Aid Office, including the annual amount of the award and whether or not the award is renewable past the first year. Tech reserves the right to make adjustments in the financial aid package offered to students who receive assistance from other sources.
- Tech scholarships and grants are based on a normal course load (12 -18). Additional costs incurred by a student taking an overload will be incurred at that student's expense.
- Recipients of the Tennessee Education Lottery Scholarship(s) who begin enrollment in any term as a full-time student must maintain full-time status throughout the semester to continue receiving this award. Exceptions to this rule must be approved by the Appeals Committee prior to the student's dropping below full-time status. Only medical and family emergency issues are considered for exceptions. More information may be found at: www.collegepaystn.com. Recipients of the Tennessee Education Lottery Scholarship(s) must complete the FAFSA every year by the state-established deadline as printed on the FAFSA.
- Students who accept/decline financial aid awards via Eagle Online are electronically signing their award and agree to the terms of the financial aid package as listed in the Tennessee Tech University Catalogue, in other Tech publications, and on the Tech website.
- The following are the definitions for enrollment status for financial aid, including Tech scholarships and grants:

- Full Time: 12 credits or greater
- 3/4 Time: 9 - 11.99 credits
- 1/2 Time: 6 - 8.99 credits
- Less than 1/2 time: less than 6 credits
- The following are earned credit requirements which establish Federal Direct Loan amount eligibility:
- Less than 30 earned credits: Freshman-level Stafford Loan (\$3,500)
- 30 to 62 earned credits: Sophomore-level Federal Stafford Loan (\$4,500)
- 63 or more earned credits: Junior and Senior-level Federal Stafford Loan (\$5,500)

Office Location and Hours

Office Location: Roaden University Center (through Summer 2017) and

Jere Whitson Hall (Beginning Fall 2017)

Hours of operation: Monday-Friday 8:00am-4:30pm

Telephone: 931.372.3073

Fax: 931.372.6309

E-mail: financialaid@tntech.edu

SCHOLARSHIPS

TTU scholarships are awarded to selected students based on academics, leadership, financial need, and other criteria.

ScholarWeb is TTU's scholarship database that houses the TTU Scholarship Application and criteria for over 600 TTU scholarships. Use ScholarWeb to apply for scholarships annually from August 15 to December 15. You can also use ScholarWeb to search your eligibility for scholarships.

University Academic Service Scholarship for Tennessee Students. The University Academic Service Scholarship is the most prominent university scholarship offered to incoming freshmen and is based upon ACT/SAT scores and high school GPA. These scholarships are offered to high school seniors who meet all criteria for the scholarship.

Students must maintain full-time status, complete service hours, and maintain a 3.0 overall combined grade point average each semester for scholarship renewal. Failure to maintain a satisfactory average or standard of conduct in any semester will result in the automatic forfeiture of a scholarship.

Community College Transfer Scholarship. The Community College Transfer Scholarship is the most prominent scholarship offered to transfer students. It is awarded to students who have recently completed a significant amount of coursework at their community college and have maintained a 3.0 inclusive combined grade point average. Students must maintain full-time status, complete service hours, and maintain a 3.0 overall combined grade point average each semester for scholarship renewal. Failure to maintain a satisfactory average or standard of conduct in any semester will result in the automatic forfeiture of a scholarship.

For more information on university scholarships, visit www.tntech.edu/scholarships or contact the Scholarship Office at 931-372-6159 or scholarships@tntech.edu.

Army Reserve Officers' Training Corps Scholarship. Students enrolled at Tennessee Technological University are eligible to apply for two-and three-year ARMY ROTC scholarships. These scholarships vary depending on availability.

Applicants are accepted from any four-year degree and two-year graduate degree program. Graduate applicants are limited to a two-year scholarship. Certain academic and physical standards must be met to apply. Recipients incur a military obligation. The Professor of Military Science administers the program at Tennessee Tech. The annual application cycle occurs September through October for the fall semester and January through February for the spring semester of each school year. Award benefits begin the semester following the award.

Tuition Assistance for Guardsmen. Contact your local recruiter.

INTERCOLLEGIATE ATHLETICS

The office of the Director of Athletics is located at the Hooper Eblen Center, the arena where many intercollegiate athletic contests occur. Tennessee Tech is a member of the National Collegiate Athletic Association (NCAA) and the Ohio Valley Conference (OVC). We participate at the NCAA Division I level in fifteen sports and in the NCAA Football Championship Subdivision in football. Tennessee Tech sponsors nine women's intercollegiate athletic teams (basketball, cross country, indoor & outdoor track, golf, soccer, softball, tennis, and volleyball), six men's teams (baseball, basketball, cross country, football, golf, and tennis), and one co-ed team (rifle). In addition to intercollegiate sports contests, concerts and other entertainment are occasionally hosted by the Department of Athletics.

In order to participate in varsity athletics, student athletes must satisfy all academic requirements of the University and must make satisfactory progress toward their degrees, as specified by the NCAA and OVC. The policies and activities of the varsity teams are regulated by the Tennessee Tech Athletics

Committee, which is composed of students, faculty, and administrative staff. Intercollegiate varsity athletic interests are promoted by the Tennessee Tech Athletic Association.

Each fulltime student receives complimentary admission to all regularly scheduled intercollegiate athletic home games. Since 1925, Tech athletic teams have been nicknamed the "Golden Eagles."

INTERNATIONAL EDUCATION

The TTU Office of International Education is responsible for international undergraduate admissions and provides international students and scholars with immigration services and community programming. In addition, the office staff coordinate study abroad programs for all TTU students.

TTU WOMEN'S CENTER

The TTU Women's Center exists to empower women in the student body, on the faculty, and on the staff of the University community through the dissemination of information, education and consultation. The Center's mission includes collaborating with other functional areas of the University to provide a range of services that will enhance the lives of women and men in the University community. The TTU Women's Center is located in Pennebaker Hall, Room 203. The director may be reached by writing Tennessee Tech, Box 5216, or by phoning (931) 372-3850.

COLLEGE OF GRADUATE STUDIES

Degree Programs

The Tennessee State Board of Education authorized the organization of a graduate program at Tennessee Technological University in May 1958. The first courses for graduate credit were offered in Summer 1958, and the first graduate degrees were conferred the following summer.

In support of the objectives of graduate study, programs leading to advanced degrees are available in the various colleges as outlined below:

College of Arts and Sciences*Master of Arts:*

English

Master of Science:

Biology

Chemistry

Mathematics

College of Business*Master of Business Administration:*

Accounting

Finance

General Management

Human Resource Management

International Business

Management Information Systems

*Master of Accountancy***College of Education***Master of Arts and Specialist in Education:*

Curriculum and Instruction:

Applied Behavioral Analysis (M.A. only)

Curriculum

Early Childhood Education

Educational Technology

Elementary Education

Library Science

Music (M.A. only)

Reading

Secondary Education

Special Education

STEM Education

Instructional Leadership

Educational Psychology & Counselor Education:

Agency Counseling (Ed.S. only)

Case Management and Supervision (M.A. only)

Educational Psychology

Clinical Mental Health Counseling (M.A. only)

School Counseling

School Psychology

Exercise Science, Physical Education and Wellness (M.A. only)

Adapted Physical Education

Elementary and Middle School Physical Education

Lifetime Wellness

Sport Management

Doctor of Philosophy

Exceptional Learning

Applied Behavior Analysis

Literacy

Programming Planning and Evaluation

STEM Education

College of Engineering*Master of Science:*

Chemical Engineering

Civil Engineering

Computer Science

Computer Software and Scientific Applications

Internet-Based Computing

Electrical and Computer Engineering

Mechanical Engineering

Doctor of Philosophy:

Engineering

Specialization areas:

Chemical Engineering

Civil Engineering

Computer Science

Electrical Engineering

Mechanical Engineering

College of Interdisciplinary Studies*Professional Science Masters*

Environmental Informatics

Manufacturing Sustainability

Doctor of Philosophy:

Environmental Sciences

Biology

Chemistry

TN eCampus Programs

Advanced Studies in Teaching and Learning (M.Ed.)

Master of Science in Nursing (M.S.N.)

Advanced Practice

Nursing Administration

Nursing Education

Nursing Informatics

Master of Professional Studies (M.P.S.)

Healthcare Administration

Human Resources Leadership

Public Safety

Strategic Leadership

TESOL (Teaching English to Speakers of Other Languages)

Training and Development

Whitson-Hester School of Nursing

Doctor of Nursing Practice (D.N.P.)
Adult-Gerontology Acute Care Nurse Practitioner
Executive Leadership in Nursing
Family Nurse Practitioner
Pediatric Nurse Practitioner-Primary
Psychiatric/Mental Health Nurse Practitioner
Women's Health Care Nurse Practitioner

ADMISSION TO GRADUATE STUDIES

Applications for admission and readmission to Graduate Studies should be made to the College of Graduate Studies by the deadline published.

Each application must be supported by official transcripts of undergraduate and graduate credit, three recommendations from persons acquainted with the applicant's scholastic and professional accomplishments (Master of Business Administration requires one recommendation), student health form and official scores made on the following: (1) all applicants into programs in the College of Arts and Sciences, the Ph.D. program in the College of Education, the M.A. program in the programs of Educational Psychology and Counselor Education, and all programs in the College of Engineering must submit scores on the General Test of the Graduate Record Examination; (2) all applicants for admission into the Master of Business Administration and Master of Accountancy programs must submit scores on either the Graduate Management Admission Test or the General Test of the Graduate Record Examination; and (3) all Master's and Ed.S. applicants into the College of Education (excluding the M.A. program in Educational Psychology and Counselor Education) must submit a recent score on the Miller Analogies Test or Graduate Record Examination. Admission to graduate study is on a merit basis and is limited to applicants who hold an earned bachelor's or master's degree from an accredited institution whose undergraduate or graduate work is, in the opinion of the College of Graduate Studies and the chairperson of the department in which the applicant proposes to study, of sufficient quality and scope to indicate high promise of success in graduate study. The University reserves the right to require additional information and/or performance when it appears that such would be appropriate to the accomplishment of degree requirements or the fulfillment of accreditation objectives.

International students having adequate preparation for graduate study may apply for admission, but applications should be filed at least six months prior to the anticipated date of enrollment. Additionally, all students from non-English speaking

countries must submit proof of adequate training and ability in the use of English as evidenced by an acceptable score on the TOEFL (Test of English as a Foreign Language), IELTS (International English Language Testing System), PTE-Academic, FLS International Language Center, ELS, TOEIC, CEFR, and SLEP. International students who wish to transfer from another university to Tennessee Tech must submit the usual materials required for initial admission; additionally, each applicant must furnish official transcripts from the current institution as well as evidence of full financial responsibility, and photocopies of visa and passport expiration dates, I-94, and I-20 identification. Additional information concerning admission, degree requirements, and other aspects of graduate study at Tennessee Tech is found in the Graduate Catalog available online at www.tntech.edu/gcatalog/ or at the Graduate Studies website www.tntech.edu/graduatestudies/.

Students who are interested in graduate study in one of the aforementioned academic areas are invited to contact the Office of Graduate Studies.

Seniors Taking Graduate Courses. Under conditions established by the Graduate Studies Executive Committee, certain seniors may be permitted to take graduate courses for graduate or undergraduate credit. These conditions have been determined in keeping with standards suggested by various accrediting agencies. Seniors who have an interest in taking graduate courses may obtain additional information from personnel in the College of Graduate Studies, Derryberry Hall. Seniors may not register for any graduate courses (numbered 5000 and above) without obtaining prior written permission from the College of Graduate Studies. Students who have not achieved senior classification are not permitted to take graduate courses. Students in the *Second Bachelor Degree or Teacher Certification* category may not register for graduate courses without obtaining prior permission from the College of Graduate Studies.

COLLEGE OF AGRICULTURE AND HUMAN ECOLOGY

Lizabeth Self-Mullens, Dean
Dennis Duncan, Director of Agriculture
Melinda Anderson, Director of Human Ecology
Andrew Courtner, Director, Student Success Center

MISSION AND PURPOSES

The mission of the College of Agriculture and Human Ecology is to promote a strong academic environment for its students and to preserve and expand knowledge in the fields of agriculture and human ecology, knowledge contained in its library and in the minds and intellects of its faculty. The College is equally supportive of the education of men, women, and minorities.

Teaching, research, and public service activities form a foundation for College goals of:

1. Providing a baccalaureate degree in the fields of agriculture and human ecology that will prepare students for entry and advancement in those fields.
2. Providing curricula that will prepare agriculture and human ecology students for entry and advancement in graduate/professional programs.
3. Providing educational experiences that will enhance agriculture and human ecology student leadership and social development.
4. Conducting scholarly and public service activities that will enhance the fields of agriculture and human ecology.

ORGANIZATION

The College of Agriculture and Human Ecology consists of two schools offering curricula leading to the bachelor's degree: (1) the School of Agriculture and (2) the School of Human Ecology.

REQUIREMENTS FOR DEGREE

Curricula in the School of Agriculture lead to the degree of Bachelor of Science in Agriculture. In the School of Human Ecology, the curricula lead to the degree of Bachelor of Science in Human Ecology. The student must complete the curriculum for the major subject chosen and must comply with the university requirements for a degree. The School Director, a faculty member, or staff Academic Advisor serves as the student's academic advisor.

SCHOOL OF AGRICULTURE

Duncan, Director; Professors Airhart, Bagley, Best, Branson, Foster, Greene, Stearman; Assistant Professors Baier, Fennewald, Leckie

The curricula of the School of Agriculture are designed to prepare students for careers in the increasingly complex and scientific field of agriculture. Following completion of the B.S. degree, students may also choose to enter graduate study.

The School of Agriculture offers the following curricula and undergraduate degree:

Major	Areas of Concentration	Degree
Agriculture	12 concentrations:	B.S.
	Agribusiness Management	
	Agricultural Communication	
	Agricultural Education	
	Agricultural Engineering Technology	
	Agricultural Science and Management	
	Agritourism	
	Agronomy & Soils	
	Animal & Pre-Veterinary Science	
	Option I: Animal Science	
	Option II: Pre-Veterinary Science	
	Environmental Agriscience	
	Horticulture	
	Nursery & Landscape Management	
	Turfgrass Management	

Individual curricula begin on Catalog page 100.
 Course descriptions begin on Catalog page 189.

AGRIBUSINESS MANAGEMENT

Agribusiness Management provides training in economics and business management principles related to production, distribution, and consumption of agricultural goods and services. Graduates enter careers in government agencies, commodity trading, communications, public relations, finance, marketing, sales, and agribusiness management.

AGRICULTURAL COMMUNICATIONS

Agricultural Communications Concentration prepares students for careers in agricultural communications and related fields. This curriculum provides an opportunity for students to combine technical agriculture with Agricultural Education, Journalism, Professional Communications, and Business Communications. Possible career areas include: agricultural information agencies; newspaper writing and editing; magazine feature writing and editing; agricultural related publications; public relations; advertising and sales; environmental reporting; and Agricultural Extension.

AGRICULTURAL EDUCATION

Agricultural Education prepares students for careers as high school agricultural education instructors, Agricultural Extension agents, and other related fields. Students learn to evaluate community needs and how to implement an educational program.

AGRICULTURAL ENGINEERING TECHNOLOGY

Agricultural Engineering Technology provides basic training in engineering and agriculture. Students are prepared to solve problems related to agricultural production and processing systems and the management and conservation of agricultural land and water resources. Graduates pursue careers in food and fiber handling and processing facilities, farm machinery sales and service, management of large mechanized farms, and other sectors of Agricultural Engineering Technology.

AGRITOURISM

Agritourism provides a cutting edge option for students looking to enter the agricultural industry or return to a home operation and increase the viability of maintaining their cultural heritage. Graduates enter careers as Agritourism enterprise managers, entrepreneurs in their own enterprise, non-formal educators serving as developers of educational activities and programs for Agritourism sites. In addition, some of our students will seek entrance into graduate school to open even more doors through Cooperative Extension and the USDA.

AGRONOMY & SOILS

Agronomy and Soils students study the complex processes of plants and composition of soil in which they grow. Areas of interest are crop science and soil science. Graduates pursue careers as agronomists; Extension agents; Natural Resources Conservation Service employees; and herbicide, fertilizer, and seed industry research and development specialists and sales representatives.

ANIMAL & PRE-VETERINARY SCIENCE

Animal Science deals with all phases of the livestock and dairy industry. Areas emphasized are nutrition, physiology, genetics, management technology, quality control, and environmental regulations. Graduates enter careers in farm management, Extension Service, food quality control, governmental health agencies, farm credit institutions, and agricultural sales and management.

The Pre-Veterinary Science curriculum is designed to enable a student to enter a College of Veterinary Medicine.

ENVIRONMENTAL AGRISCIENCE

Environmental Agriscience is an environmentally oriented curriculum that offers courses in soils, geology, ecology, hydrology, and biology in an environmental context in addition to traditional agriculture courses. Graduates in the Environmental Agriscience concentration could work in fields such as water quality, reclamation, and developing environmental impact statements. Environmental consulting firms, the EPA, state health departments, the Natural Resources Conservation Service, and the Agricultural Extension Service are a few examples of possible employers.

HORTICULTURE

Horticulture combines training in the biological and physical sciences with sound plant cultural practices. Training is offered in plant identification, production and handling of greenhouse and nursery crops and landscape design and management. Graduates enter careers in management, production, processing, sales, education, and governmental agencies related to the green industries.

NURSERY & LANDSCAPE MANAGEMENT

Nursery and Landscape Management provides students an opportunity to combine agribusiness management training and horticulture training for managerial positions in the nursery and landscaping industries.

TURFGRASS MANAGEMENT

Turfgrass Management provides basic training in the science and culture of managing turfgrasses and the economics and business management principles related to the turf industry. Graduates are prepared to pursue careers in management of athletic turf, golf courses, municipal, industrial, home lawns and other types of turf and related business.

SCHOOL OF HUMAN ECOLOGY

Professor Anderson, Director; Professors Mullens (Dean), Plant, Swafford; Associate Professor Shipley; Assistant Professors Chitiyo, Gnegy; Instructor Sisk; Lecturers Hutson, Paradis

The discipline of Human Ecology, also known as Family and Consumer Sciences, exists to enhance the quality of life for individuals, families and communities. The body of knowledge incorporates the integrative elements of human ecosystems and life course development. Inclusion of core concepts such as basic human needs, individual well being, family strengths and community vitality prepare graduates to work with individuals and families using a holistic perspective. Understanding the influences both external and internal environments have on quality of life is the foundation of the discipline. Graduates find employment in a variety of settings including: health care, education, management, design, marketing/retailing, and human service professions.

The School of Human Ecology, Child Development and Family Relations (CDFR) concentration has met the standards and criteria required for the Provisional Certified Family Life Educator (CFLE) designation from the National Council on Family Relations (NCFR).

Beginning in Fall 2016, students who graduate from the School of Human Ecology CDFR curriculum (and have met all CFLE course requirements) now qualify to complete an abbreviated CFLE application process.

This program approval does not imply accreditation, but recognizes the inclusion of relevant course work for each of the ten family life content areas needed for the Provisional Certified Family Life Educator designation.

The School of Human Ecology offers the following curricula and undergraduate degree:

Major	Areas of Concentration
Human Ecology	Child Development & Family Relationships
	Child Life
	Family & Consumer Sciences Education
	<ul style="list-style-type: none"> Career and Technical Education License Occupational Family & Consumer Sciences Education endorsements Child Care Services Culinary Arts Fashion & Fabric Services
	Food Systems Administration
	Housing & Design
	Merchandising & Design
	Nutrition & Dietetics

Individual curricula begin on Catalog page 100.
Course descriptions begin on Catalog page 188.

CHILD DEVELOPMENT AND FAMILY RELATIONS

The Child Development and Family Relations concentration offers a holistic, ecological and integrative perspective on children and families. Course work provides in-depth knowledge to prepare graduates for careers working with people across the lifespan in a variety of human service settings including: government agencies, children's services, cooperative extension and others.

CHILD LIFE

The Child Life program, a gateway to the Certified Child Life Specialist (CCLS) credential, is coordinated with the Child Life Council's professional, programmatic and educational needs of the child life practitioner.

Application to the Child Life program at TTU is required and should be made in the second semester of sophomore year after completing HEC 2250 and while enrolled in HEC 2550.

There are four components of eligibility to sit for the certification examination:

1. Baccalaureate degree

2. Course work including a minimum of 10 college-level courses in child life or a related department/subject
3. Clinical Child Life Experience (480 hours under the direct supervision of a CCLS in good standing)
4. A minimum of one college level class taught by a Certified Child Life Specialist and meeting Child Life Council course content requirements.
5. Please see Child Life Council webpage www.childlife.org for current eligibility requirements.

FAMILY AND CONSUMER SCIENCES EDUCATION

Family and Consumer Sciences Education prepares students for careers as FACS teachers in middle and high schools, as USDA Cooperative Extension Agents and for other human services profession. Licensure is available and required only for teaching professions.

FOOD, NUTRITION AND DIETETICS

The Food, Nutrition and Dietetics curriculum offers two options. In the Dietetics option, students are prepared for careers in health care, community health agencies, food research, and food management positions within the food and nutrition industry. In the food systems administration option, the focus is on training students for careers in food production and service, management opportunities in the food industry, and entrepreneurial activities.

HOUSING AND DESIGN

Housing and Design focuses on adapting space to meet the psychosocial and physical needs of people in residential and commercial environments. Graduates pursue careers in interior space planning, design of the built environment, historic preservation, real estate, and furnishings and sales.

MERCHANDISING AND DESIGN

Merchandising and Design curriculum focuses on the design, production, distribution and selection of consumer products. Career opportunities include positions in management, merchandise buyer, sales representative, shopper/stylist, fashion coordinator, textile researcher, fashion designer and many others.

MINOR IN HUMAN ECOLOGY

The minor in Human Ecology consists of 15 semester hours of courses offered by the School of Human Ecology as follows:

Minor Requirements:

- HEC 1010. Life Span Development Credit: 3.
- HEC 1020. Social and Professional Etiquette Credit: 1.
- HEC 3011. Consumer Economics Credit: 3.
- HEC Electives Credit 8.

COLLEGE OF ARTS AND SCIENCES

Paul B. Semmes, Dean
Kurt Eisen, Associate Dean

Mission and Scope

The College of Arts & Sciences provides a liberal arts education for all TTU students, strong major programs in more than thirty areas of study, high-quality foundational courses for students in programs outside the College, and new knowledge through faculty and student research. In pursuing this mission, the College emphasizes the skills and perspectives vital to lifelong education and decision-making in a democracy. These include critical and contextual thinking, effective communication, active learning, and proficiency with technology. Across the ten departments, many courses address one or more of the following major issues: environmental problems, the complex relations of science and society, and the coexistence of differing cultural or ethnic groups within the U.S. and around the globe.

GENERAL REQUIREMENTS FOR A BACCALAUREATE DEGREE IN THE COLLEGE OF ARTS AND SCIENCES

A student must satisfy the general university requirements for a baccalaureate degree. The departmental chairperson, or a faculty member designated by the chairperson, serves as the student's academic advisor.

MINOR IN ARTS AND SCIENCES

A minor for Arts and Sciences students requires the completion of 15 semester hours, including 6 upper-division hours, in a coherent program of study. The criterion of coherence may be met in either of two ways: (1) by following the minor curriculum prescribed by any department or college at TTU, so long as it includes at least 6 upper-division hours; (2) if such a minor curriculum is not available in the chosen department or college, by taking the 15 semester hours, including 6 at the upper division, in a single discipline—i.e., normally, courses with the same course prefix, but students should check with the department offering the minor before assuming this. Exception: A minor in physics will consist of at least 15 hours of coursework including PHYS 2110, PHYS 2120, PHYS 2420, PHYS 2920 and one upper division physics course. Approved interdisciplinary minors in the College of Arts and Sciences are:

Environmental Studies

Home: Department of Earth Sciences.

Advisor: Dr. Larry Knox, Kittrell Hall 201 or 103 (lknox@tntech.edu).

Preparation: Students wishing to minor in Environmental Studies must fulfill their general education science requirement by taking any two of the following courses: BIOL 1010, BIOL 1020, BIOL 1110, BIOL 1120, CHEM 1010, CHEM 1020, CHEM 1110, CHEM 1120, GEOL 1040, or GEOL 1045.

The Minor: A minor in Environmental Studies will consist of at least 15 hours of coursework, with a minimum of 6 upper-division hours, including the following:(a) HIST 2900

Environmental History; (b) One of the following: SOC 3600 - Environmental Sociology or AGBE 4120 (5120); (c) 9 additional semester hours chosen from the course list below, including at least: one course at the 3000-4000 level and two of the following areas of study: Agriculture, Biology, Chemistry, Geography, Geology, and Sociology (note: WFS is considered to be Biology).

AGET 3110, AGRN 1010, AGRN 2210, AGRN 3230, AGRN 4220, AGRN 4230, BIOL 3120/WFS 3120 or BIOL 3130/WFS 3130, BIOL 4130, BIOL 4610, BIOL 4840, CHEM 3710, CHEM 4710, ENGL 4930 or ENGL 4931, GEOG 1010, GEOG 3330, GEOL 4100, GEOL 4150, GEOL 4410, GEOL 4650, GEOL 4710, SOC 3600, WFS 4500.

Note: Except for Biology majors, students who did not take BIOL 1010-BIOL 1020 under "Preparation" (above) must take BIOL 3120/WFS 3120 or BIOL 3130/WFS 3130 as part of the "9 additional hours."

Professional Communication

Home: Department of English and Communications.

Advisor: Dr. Kristin Pickering, Henderson Hall 312A (kpickering@tntech.edu).

Curriculum: A minor in Professional Communication will consist of PC 2500 or SPCH 2410 and at least 12 additional hours of coursework from the following: PC 3250 Professional Communication I, PC 3700 Technical Documents in the Professions, PC 3750 Ethics in the Professions, PC 4850 Internship, PC 4970 Professional Communication II, and PC 4990 Seminar in Professional Communication.

Speech Communication

Home: Department of Communication

Advisor: Dr. Halina Ablamowicz, Henderson Hall 102 (hablamowicz@tntech.edu).

Curriculum: A minor in Speech Communication will consist of: COMM 2025 or PC 2500. Additionally the minor will consist of 4 courses offered by the speech communication program, two of the courses must be upper division (3000 and above). COMM 4440 Semiotics can be applied to the minor in speech communication.

Students who complete a minor in Speech Communication will receive a certificate from the Division of Communication, Department of English and Communications.

Web Design

Home: Department of English and Communications.

Advisor: Dr. Kristin Pickering, Henderson Hall 312A (kpickering@tntech.edu).

Curriculum: A minor in Web Design will consist of the following courses: CSC 1070 Elementary Programming or an approved programming course, WEBD 1500 Introduction to Web Design, WEBD 2300 Web Site Design: Dynamic Sites, WEBD 4950- Advanced Web Page Design, and WEBD 4975 Seminar in Web Design.

Women's and Gender Studies Minor

Home: Department of History.

Advisor: Dr. Paula Hinton, Henderson Hall 112

(phinton@tntech.edu)

Curriculum: A minor in Women and Gender Studies requires completion of WGS 2010 and a minimum of 12 additional credit hours of course work (including 6 upper division hours) in approved courses.

A minimum of 6 credit hours must be chosen from the following core courses:

ENGL 4731 (5731). Approaches to Women and Literature Credit: 3.

HIST 4350-4359 (5350). Gender Studies Credit: 3.

HIST 4370 (5370). Women in American History Credit: 3.

POLS 3400. Gender and Politics Credit: 3.

SOC 2200

The remaining 6 credit hours:

May include additional core courses listed above or approved courses that contain a significant focus on women

and/or gender, or in which a student may individually contract with course instructor to focus on women and/or gender issues. These courses include but are not limited to the following:

ENGL 4920 (5920). Literature and Technology Credit: 2.

HIST 4360-4369 (5360). U.S. Social History Credit: 3. (may be repeated if topic is different)

HIST 4440-4449 (5440). Native American Studies Credit: 3. (may be repeated if topic is different)

POLS 3200. American Political Thought Credit: 3.

POLS 3800

POLS 4610. Public Administration and Public Policies Credit: 3.

SOC 2630. Marriage and Family Relations Credit: 3.

SOC 2840. The Aged in American Society Credit: 3.

SOC 4210 (5210). Race, Ethnicity and Multiculturalism

Credit: 3.

SOC 4610 (5610). Contemporary American Family Credit: 3.

HON 4010; and 4900 in various disciplines

Note:

No student will receive credit toward both the major and minor from the same course. Student contracts must be approved by the instructor before the last day to add classes.

Undergraduate Curricula

The College of Arts and Sciences offers the following curricula and undergraduate degrees:

Department	Curriculum	Concentration	Degree
Biology	Biology	Biology	B.S.
		Cellular & Molecular	B.S.
		Environmental Biology	B.S.
		Health Sciences Biology	B.S.
	Wildlife and Fisheries Science	Conservation Biology	B.S.
		Fisheries Science	B.S.
		Wildlife Science	B.S.
Chemistry	Chemistry	Applied Chemistry	B.S.
		a. Business Chemistry	B.S.
		b. Environmental Chemistry	
		c. Forensic Chemistry	
		d. Health Sciences	
		e. Industrial Chemistry	
		f. Chemistry	
Communication	Communication	Biochemistry	B.S.
		Pure Chemistry	B.S.
		Journalism	B.S.
		a. News Editorial	
		b. Public Relations	
Earth Sciences	Geosciences	Communication Studies	B.S.
		Environmental Geology	B.S.
		Geographic Information Systems	B.S.
		Geography	B.S.
		Geology	B.S.
English	English	Creative Writing	B.A.
		Language and Rhetoric	B.A.
		Literature	B.A.
		Professional and Technical Communication	B.A.

		Theatre	B.A.
		a. Performance	
		b. Technical	
Foreign Languages	Foreign Languages	French	B.A.
		German	B.A.
		Spanish	B.A.
History	History		B.A., B.S.
Mathematics	Mathematics		B.S.
Physics	Physics	Traditional Physics	B.S.
		Applied Physics	B.S.
Sociology and Political Science	Political Science	Political Science	B.S.
		Legal Studies	B.S.
	Sociology	Sociology	B.S.
		Criminal Justice	B.S.
		Social Work	B.S.
Interdisciplinary	International Business and Cultures		B.S.
Pre-Professional Non-Degree	Pre-Dental Hygiene Pre-Dentistry Pre-Health Information Management Pre-Medical Technology Pre-Medicine Pre-Occupational Therapy Pre-Optometry Pre-Pharmacy Pre-Physical Therapy Pre-Physician Assistant		

Individual curricula begin on Catalog page 100.
Course descriptions begin on Catalog page 189.

*The International Business and Cultures curriculum is shared by the Colleges of Business and Arts and Sciences. Jointly administered by the Department of Economics, Finance, and Marketing (Business) and the Department of Foreign Languages (Arts and Sciences), it leads to a joint B.S. degree, not a separate degree in either college.

INTERDEPARTMENTAL PROGRAMS AND ACTIVITIES

All College of Arts and Sciences programs cross over departmental lines to bring in appropriate experiences from other disciplines. Some programs, however, require an unusually broad set of activities to accomplish their goals. The *B.S. in International Business and Cultures* uses the resources of two colleges in preparing students to solve complex problems in international commerce. The *pre-professional programs* draw from a wide spectrum of sciences, humanities, and social sciences as they prepare students for careers in medicine, law, and the allied health sciences. In addition to department-based minor programs, students can choose from several interdisciplinary minors: Women and Gender Studies, Environmental Studies, Education or Business. Finally, the Internship in Technology and Community Development adds an applied technology credential to the student's major.

PRE-PROFESSIONAL PROGRAMS

The College prepares students for professional training in law, medicine, dentistry, and other health sciences. All the courses required or recommended for pre-professionals are annually revised and updated to make certain students are well-prepared and are competitive on required aptitude tests (DAT, LSAT, MCAT, OAT, PCAT, VCAT). Among the many opportunities for active learning related to pre-professional studies are: the mock-trial team, speech and debate teams, internships and work experiences, and pre-professional student groups, such as the Chem- Med Club, which provide trips to professional schools and interactions with other pre-professional students and with prominent practitioners in the various fields. Should a student later decide not to pursue entrance to a professional school, TTU offers a wide range of degree options that capitalize on the pre-professional work already accomplished. <https://www.tntech.edu/cas/healthsciences/>

PRE-LAW

Pre-law students have no fixed requirements, but law schools recommend they major in a discipline known for its rigor in analytical thinking and communication. Pre-law students are advised by a team of professors—in Business, English, History, Political Science, and Sociology—led by Associate Professor Lori

Maxwell (Immaxwell@tntech.edu) of the Sociology and Political Science Department.

PRE-PROFESSIONAL HEALTH SCIENCES

The pre-medicine, pre-dentistry, pre-pharmacy, pre-optometry and pre-allied health science students must take certain courses required by the professional school while at TTU, but they can do so while pursuing almost any major. In most pre-professional health science areas, students have the option of obtaining a B.S. in Applied Chemistry from TTU after three years at TTU and one year at a professional school. Pre-veterinary students have the special option of majoring in Agriculture with a concentration in animal science. Pre-professional health science students are advised by and Instructors Ann Marie Carrick (acarrick@tntech.edu) and Janet Coonce (jcoonce@tntech.edu) and advisor Thomas Turner (tltturner@tntech.edu) <https://www.tntech.edu/cas/healthsciences/>. Pre-veterinary students are advised by Professor Bruce Greene (bgreene@tntech.edu) in the School of Agriculture.

INTERNSHIP IN TECHNOLOGY AND COMMUNITY DEVELOPMENT

This internship program is designed for the student who is completing a bachelor's degree program that does not include a significant application of current computer technologies to "real-world" problems and needs. During three of the student's last four semesters in a major program in the College of Arts and Sciences at Tennessee Tech, he or she will register for CAS 4910, CAS 4920, and CAS 4930, in that order, for one semester each, and not simultaneously. A certificate is awarded upon completion of all three courses, each with a passing grade.

GRADUATE PROGRAMS

Graduate curricula lead to the Master of Science degree in biology, chemistry, and mathematics, the Master of Arts degree in English, and the Doctor of Philosophy degree in Environmental Sciences. For details, consult the TTU Graduate Studies office.

TEACHER LICENSURE

Students may major in the College of Arts and Sciences and work towards teacher licensure, although in some cases they may be required to earn more than 120 hours.

For more information consult the College of Arts and Sciences web page: www.tntech.edu/cas/.

STUDENT SUCCESS CENTER

Edith Duvier, Director/Advisor

Advisors: Deborah Allen, Samantha Bates, Angela Clark, Jennifer Dyer, Whitney Foust

The Student Success Center (SSC) serves undergraduate freshmen and sophomore students within the College of Arts and Sciences as well as students who are in General Curriculum, General Health Studies, and General Pre-Law. Advisors within the SSC assist Arts and Sciences students to navigate their freshmen and sophomore years within their chosen major and comply with University requirements. In addition, the SSC acts

as a resource for students and faculty who have questions or who need assistance as an upper classmen.

The SSC is especially committed to guiding students as they progress in their education by providing individual academic advising. Students will receive assistance with selecting general education courses, basic major requirements, choosing appropriate degree programs and career paths, and help in solving problems that could cause them to be unsuccessful academically. The following majors are advised in the College of Arts and Sciences Student Success Center: Biology/Wildlife Fisheries, Communication, English, History, Geosciences, General Curriculum, General Health Studies, General Pre-law, International Business and Cultures, Mathematics, and Psychology. (Departments within the College of Arts and Sciences not listed here are advised by faculty within the Departments).

General Curriculum (GECU) is for students uncertain about their career goals or who want to explore a new major. Students will receive advising and guidance aimed at helping students make an educated decision about their future careers. Students who meet departmental qualifications may transfer to an academic department upon request but can stay until they have earned 60 credit hours.

General Health Studies (GHS) is for students who plan to enter nursing or one of the pre-professional fields. Students will receive career counseling and begin fulfilling their general education requirements while preparing for their chosen education and career.

General Pre-Law (GEPL) is for students who plan on entering law school after graduation from the University. Advisors aid students in selecting a major that will prepare them for their future education and careers. Students are also encouraged to join the Pre-Law Club where they will meet other students with similar interests in law.

General Curriculum (GECU) and General Pre-Law (GEPL)

(The following first-year curriculum is recommended for students who are in the process of selecting a specific major.)

Freshman Year

ENGL 1010 - Writing I Credit: 3.

ENGL 1020 - Writing II Credit: 3.

Math Credit 3-5.¹

Natural Science Credit 8.²

Social/Behavioral Science Credit 6.³

Humanities Credit 6.⁴

UNIV 1020 - First-Year Connections Credit: 1.

Total: 30

Note:

¹ Course selected in consultation with academic advisor.

² Select from the following: ASTR 1010, ASTR 1020; BIOL 1010, BIOL 1020; BIOL 1105; BIOL 1114, BIOL 2110; BIOL 2010, BIOL 2020; CHEM 1010, CHEM 1020; CHEM 1110, CHEM 1120; GEOL 1040, GEOL 1045; PHYS 2010, PHYS 2020; PHYS 2110/PHYS 2111, PHYS 2120/PHYS 2121. Students should confer with an academic advisor regarding the specific course selection.

³Select two Social/Behavioral Science courses from the approved list.

⁴Select two Humanities/Fine Arts courses from the approved list.

General Health Studies (GHS)

General Health Studies students may pick up an advising sheet for their particular area of interest in the Student Success Center in Henderson Hall, room 202.

DEPARTMENT OF BIOLOGY

Professor Kissell, Chairperson; Professors Ballal, Berk, Bettoli, Combs, Cook, Harris, Hayslette, Mattingly; Associate Professors Brown, Gunderson, Murdock; Assistant Professors Beck, Carver, Hurt, Krosnick, Perkin, Walter; Instructor Pirkle; Lecturers Gibbs, Panter, Swallows

Courses in biology are for students who plan to pursue a major in the field of biology or wildlife and fisheries science; for students who plan to enter medical school, dental school, nursing school, or schools of medical technology; and for students in other fields of study who desire to develop a scientific attitude and to acquaint themselves with the phenomena of living organisms.

Students who plan to continue the study of biology on the graduate level or to prepare for industrial or governmental positions in the field should complete the Biology Curriculum. Curricula preparatory to the study of Medicine, Dentistry, and Medical Technology are given on preceding pages.

Tennessee Technological University is affiliated with the Gulf Coast Research Laboratory at Ocean Springs, Mississippi. This affiliation permits students to enroll in marine biology courses that would otherwise be unavailable this far inland.

The Biology Department is unique in Tennessee for its Cooperative Fishery Research Unit supported jointly by the U.S. Geological Survey, the Tennessee Wildlife Resources Agency, and Tennessee Technological University. A primary function of the unit is to strengthen the graduate fisheries program; however, undergraduates interested in fisheries biology often find opportunities for valuable experience through association with Unit activities.

DEPARTMENT OF CHEMISTRY

Professor Boles Chairperson; Professors Glinski, Lisic, Zhang; Associate Professors Crouse, Jiang, Swartling; Assistant Professors Callender, J. Carrick, W. Carroll, Gichuhi, Hawkins, Rezsnyak, Zhan; Instructors A.M. Carrick, Coonce, Rust; Lecturers Carroll, Cashman

Within the major in Chemistry, the Department of Chemistry offers three concentrations leading to a Bachelor of Science Degree:

1. The Pure Chemistry concentration is intended to prepare students for both graduate school and a career as a professional chemist. This concentration exceeds the requirements for certification by the American Chemical Society.
2. The Applied Chemistry concentration is composed of the 6 options outlined below:

- a. Business Chemistry – This option is intended for those who are more interested in the business side of the chemical industry or in a management career in a technical industry. The non-chemistry component of this option includes most, if not all, of the coursework necessary to enter the +1 MBA program offered by the TTU College of Business.
- b. Environmental Chemistry – Chemistry plays a central role in all environmental issues. No student can be considered prepared to contribute to this field without a solid background in chemistry. This option incorporates a significant amount of supporting coursework in contributing sciences, such as biology, agriculture, and geology.
- c. Forensic Chemistry – Forensic science is an interdisciplinary field incorporating aspects of chemistry, biology, and physics. While it is certainly an area of current popular interest, it has long been a career pathway for chemistry graduates, whose curriculum fits these demands particularly well. This option combines the essential elements of chemistry with supporting coursework in biology and criminal justice.
- d. Health Sciences Chemistry - This option provides a four-year content degree in chemistry for students who have pursued non-degree curricula in pre-medicine, pre-dentistry, pre-pharmacy, pre-optometry and other related pre-health programs. Supporting coursework in biology is chosen from those courses required or encouraged by professional schools.
- e. Industrial Chemistry – This option is intended for students who wish to pursue a technical career in a chemistry-related industry. Many companies seek employees with a chemical background but do not need the rigorous training found in the ACS Chemistry concentration. An integral part of this program is a minimum of one year of cooperative employment experience.
- f. Chemistry – This option maintains the flexibility of the current program, allowing adaptation to new areas of interest as they develop.

3. The Biochemistry concentration is intended to serve pre-professional students and those who wish to pursue graduate work at the chemistry-biology interface.

A.C.S. certification is also possible in the Applied and Biochemistry concentrations by taking a number of additional courses beyond those listed in the catalog curricula.

Pre-Professional Programs

FOR DEGREE PROGRAMS - SEE APPLIED CHEMISTRY

Students who intend to obtain a baccalaureate degree and major in a pre-health science program should see the curriculum for Chemistry, Applied Chemistry Concentration.

Pre-professional programs are designed to satisfy minimum requirements for admission to professional schools. Some students complete only these minimum course requirements prior to seeking admission to the professional school; some students enroll in degree programs such as biology, chemistry, engineering, physics, or others, and also take courses to complete the minimum professional school requirements because many of the courses satisfy requirements in both programs. In the case of pre-law, there is no specific degree required; therefore, students interested in law usually pursue a bachelor's degree in a field of their interest such as history, political science, or some area of business.

DEPARTMENT OF COMMUNICATION

Professor Wilson, Chairperson; Professors Ablamowicz, Stewart, Witcher; Associate Professor Ding; Assistant Professor Christen; Instructor Metz; Lecturers Mestayer, Seiber

Communication

With concentrations in Journalism and Communication Studies, the Communication major produces graduates who understand the powerful role of communication in all aspects of society. The Journalism curriculum prepares students for a variety of employment opportunities in the mass communication and media professions, primarily in the print media and public relations as well as corporate communication. The program stresses practical experience. The student newspaper, yearbook, and radio station, and the regional PBS-affiliate television station are integrated with class work, and students are encouraged to participate in the internship or co-op program. The concentration in Communication Studies fosters the understanding of the process and practice of communication among individuals, groups, organizations, and cultures. Emphasis is on effective and ethical communication skills for success in virtually all kinds of situations. Students may participate in speech and debate team activities. Upon graduation they are ready to begin careers in business, government, law, education, politics, social and human services, international relations and negotiations, or further study on the graduate level.

DEPARTMENT OF EARTH SCIENCES

Professor Harrison, Chairperson; Professors Hart, Leimer, Li; Assistant Professors Asante, Wolak

The mission of the Department of Earth Sciences is threefold:

1. To provide a robust undergraduate learning and research experience for geoscience students.

2. To demonstrate the importance of the geosciences to society.
3. To promote faculty research, scholarly activity and interdisciplinary collaboration.

Our department mission supports the overall missions of the University and the College of Arts and Sciences.

DEPARTMENT OF ENGLISH

Professor Pelton, Chairperson; Professors Baker, Burdick, Creter, Eisen (Associate Dean), Kash, Laird, McQuail, Null, O'Rourke, Pickering, Saya, Williams; Assistant Professors Bounds, Deiter, Hunt; Instructors Fisk, Rideout, Robinson, Smith; Lecturers Henry, Kean, Moynihan

The English language and literature curriculum is designed to improve students' skills in writing, critical reading, and thinking; to enrich their cultural experience; and to prepare them for all professions requiring a high level of expression, imagination, and intellectual activity, including creative writing, editing, teaching, law, politics, and management.

The English major includes four concentrations: Literature, Writing, Professional Communication, and Dramatic Arts. All are designed to prepare students for careers that require the ability to think critically, write clearly and imaginatively, and understand diverse cultural contexts. The Literature curriculum develops strong critical and textual skills, and allows students to discover great literary works of the past and present, providing an excellent foundation for graduate study in English and related fields. In the Writing concentration students explore the arts of creative expression and rhetorical discourse, grounded in the study of literary traditions. The concentration in Professional Communication provides students with knowledge of skills, strategies, and theories necessary for employment in various workplace and technological settings, with options in Corporate Culture, Information Architecture, and Scientific and Technical Writing. In the Dramatic Arts program students focus on the literary traditions and performance arts that come together in the theatrical experience, preparing students for lifelong engagement with the arts while providing a solid foundation for graduate study or any profession that requires teamwork and creativity.

DEPARTMENT OF FOREIGN LANGUAGES

Assistant Professor Sheehan, Interim Chairperson; Associate Professors Baker, Barnard, Groundland, Hays; Assistant Professor Villalba; Instructor Martin

The foreign language curriculum is designed to give training in the language, literature, history, and customs of the peoples whose language is studied; to provide insights into the various means of organizing thought and reality by native speakers of the language; to enable students to understand the history and development of their own language; to provide the appropriate background for graduate studies in foreign languages; and to train students for various careers in which knowledge of other cultures and languages is needed. The Department offers two options. Option one is designed for students seeking a major in Foreign Languages with a concentration in French, German, or

Spanish. Although a minor is not required, it is strongly recommended, especially for students who plan careers in teaching, government service, or other language related areas. Option 2 is designed for students who are concurrently earning a B.S. degree in engineering, engineering technology, computer science, mathematics or the physical or biological sciences. The B.S. degree in International Business and Cultures combines economics, finance, management and marketing with language study.

DEPARTMENT OF HISTORY

Professor Roberts, Chairperson; Professors Birdwell, Kharif, Laningham, Reagan, Webb; Associate Professors Dollar, Hinton; Assistant Professors Driggers, Propes, Smith; Instructors Davis, Hardy

The broad liberal arts curriculum of the History Department offers students a traditional education and preparation for many different professions. The content courses in history, for example, require students to think analytically, conduct research, and to communicate effectively both in written and oral forms. These are highly adaptable skills. The department assists each student by providing career guidance in a professional orientation course. One history professor advises pre-law students. The department provides excellent preparation for traditional graduate study, exemplified by TTU history majors who have earned advanced degrees at the outstanding graduate schools.

DEPARTMENT OF MATHEMATICS

Professor Mills, Chairperson; Professors Ablamowicz, Gutek, R. Le Borne, Liu, Norden, Shibakov, Smith; Associate Professors Allen, Chambers, Hetzel, Kubiak, Machida, O'Connor; Assistant Professors Davis, Veerapen, Zheng; Instructors Brachey, Elliott, Gandhi, Narimetla; Lecturers Brown, Daniels

The Department of Mathematics offers a well balanced curriculum that can prepare students for immediate entry into the workforce or for further study at the graduate level. The curriculum provides students with a solid foundation in mathematics while offering flexibility in course selection. Students can prepare for many different careers in business, industry, education, and government. Among the alumni of the department are teachers, professors, lawyers, financial professionals, insurance industry executives, software engineers, as well as researchers and administrators in the defense industry.

Four optional concentrations of courses are available: Actuarial Mathematics, Applied Mathematics, Pure Mathematics, and Statistics. However, a student is not obligated to follow any of these four concentrations. Faculty members who serve as academic advisors can help students develop a course of study appropriate for their individual career goals. Students interested in pursuing a Master's degree in mathematics can apply for entry into the BS/MS Mathematics Fast Track program and begin graduate mathematics coursework as an undergraduate student.

Students planning to major in mathematics should complete 4 years of mathematics in high school, including algebra, geometry, trigonometry, and precalculus mathematics.

DEPARTMENT OF PHYSICS

Professor Robinson, Chairperson; Professors Ayik, Kozub, Murdock, Semmes (Dean), Shriner; Associate Professor Engelhardt; Assistant Professors Holley, Kidd, Rajabali; Lecturer Yeter-Aydeniz

The Physics Curriculum is designed to accommodate students with a variety of goals: those who wish to prepare for graduate study leading to advanced degrees in physics, those who plan to do graduate work in another field of science or engineering, and those who intend to seek employment immediately after receiving the baccalaureate degree. The basic science background and analytical thinking skills acquired by taking physics courses, combined with the broad knowledge base which characterizes all Arts and Sciences degree programs, has proved to be excellent preparation for a wide variety of careers. This includes endeavors previously viewed as "non-scientific," as virtually all walks of life have been engulfed by the current technological revolution.

Students preparing for graduate study in physics will normally follow the Option I program. The others will follow an approved Option II program which contains, in addition to a solid core of physics courses, a concentration of electives in another area of science and/or engineering, such as electrical engineering, molecular biology, or computer science. Both programs lead to the Bachelor of Science degree in physics. Students in both options are eligible for summer employment in one of the research groups in the Department, for physics scholarships, and for participation in the Cooperative Education Program.

DEPARTMENT OF SOCIOLOGY AND POLITICAL SCIENCE

Professor Maxwell, Interim Chairperson; Professors Gunter, Haynes, Norris, Raymondo; Associate Professors Anderson, Stanger; Assistant Professors Carlton, Navarro, Seiler; Instructor Brown

The Department of Sociology and Political Science offers a Bachelor of Science degree in Sociology; a concentration in Criminal Justice within the B.S. Sociology degree; a concentration in Social Work within the B.S. Sociology degree; undergraduate minors in Criminal Justice, Political Science, Philosophy, Anthropology, and Sociology; and a graduate minor in Sociology; undergraduate minors in Criminal Justice, Political Science, Philosophy, Anthropology, and Sociology; and a graduate minor in Sociology. (Note: In some cases completing a minor will require transfer credit or on-line hours. Many of the courses in the department are restricted to declared majors.)

Political Science

A Bachelor of Science Degree in Political Science is offered with courses in each of the six main areas of specialization within the discipline: International Relations, Comparative Politics, Political Theory, American Government, State and Local Government, and Public Administration. A student who majors in Political Science at Tech is provided a broad liberal arts education with adequate specialization in the major and ample opportunity to take elective courses in related areas. Graduates

are well-prepared for a number of options: graduate studies, law school, employment in government or private business.

Anthropology

Cultural Anthropology courses are offered when staff are available.

Sociology

The Sociology curriculum has three main purposes: (1) to aid students in understanding the roles of social forces and ideas in shaping modern society; (2) to provide a well-rounded education preparing the student for a wide range of occupations, particularly those which work directly with people or with categories or groups of people; and (3) to provide a sound academic background for graduate study in sociology or for such professions as law or the ministry.

Criminal Justice

Advisor: Dr. Mannle

The Criminal Justice Program offers a baccalaureate (B.S.) concentration, and a minor (15 hours) in criminal justice. The B.S. concentration involves a major in Sociology with a large proportion of course work in criminal justice.

Those who complete the B.S. degree will have a sound foundation that prepares them to compete for positions in law enforcement, corrections and social service agencies, or for admission to law school.

Social Work

The Department of Sociology and Political Science offers a social work concentration for those students interested in a career in social work.

Social work is a "helping profession" that assists people who face difficult problems. Some social workers do their work in family service agencies dealing with marriage, health and child welfare problems. Others work in a medical setting providing assistance to patients and their relatives during a health crisis or a death. Still others work in the area of corrections assisting juvenile and adult law violators in rehabilitation. Social workers can also be found in public welfare agencies assisting the poor and disabled and in industry assisting employees with chemical abuse problems.

Philosophy

Philosophy courses are designed to help students acquire appreciation for the values and modes of reflection appropriate for the philosophical mind. They seek to stimulate interest in the ultimate human questions and to help students understand the proposed answers to those questions given by thinkers across the centuries. A baccalaureate minor is available and is especially appropriate for those interested in the humanities, the social sciences, and the professions.

Sociology Major

The Sociology Major at Tennessee Tech University leads to the Bachelor of Science Degree and includes three tracks: a

Bachelor of Science in Sociology; a Bachelor of Science in Sociology with a concentration in criminal justice; and, a Bachelor of Science in Sociology with a concentration in social work.

Core of Required Courses Common to the Major (all three tracks): (27 hours)

- SOC 1010 Introduction to Sociology
- SOC 3100 Sociological Theory
- SOC 3900 Introduction to Social Research
- SOC 3910 Social Science Statistical Analysis
- SOC 4920 (5920) Data Analysis and Management or
- SOC 4930 (5930) Field Research Methods
- Foreign Language (3) (Culture and Civilization courses do not qualify)
- Electives in Social Sciences/Philosophy (9)

Students will take 9 hours of elective courses in the social sciences/philosophy consisting of any course that meets the Social/Behavioral Sciences General Education Requirement, and/or are from the disciplines of: anthropology, criminal justice, economics, geography, philosophy, political science, psychology, social work, or sociology.

Note: For the criminal justice concentration 3 hours of the electives in Social Sciences/Philosophy must be at the upper division level. The social work concentration meets the Social Sciences/Philosophy requirement by 9 hours embedded in the major (PSY 2010, PSY elective, and PHIL 2250).

Additional graduation requirements must be satisfied including but not limited to: a total of 120 semester hours; a total of 36 hours earned at the upper division (3000 or 4000 level courses); and, satisfactory completion of the general education requirements. Students are responsible for ensuring that they meet all requirements for graduation, and should consult with their academic advisor on a regular basis.

To complete the general sociology track:

In addition to the required core of 27 hours, students will complete an additional 21 hours of elective courses chosen from courses with a sociology, criminal justice, or social work prefix. **A minimum of 15 hours must be at the upper division level.**

Total hours in the major: 48.

Total hours of sociology/SW/CJ courses: 36-45.

Total hours required for graduation: 120.

To complete the criminal justice track:

The Criminal Justice Program offers a baccalaureate (B.S.) concentration, in criminal justice. The B.S. concentration involves a major in Sociology with a large proportion of course work in criminal justice.

Those who complete the B.S. degree will have a sound foundation that prepares them to compete for positions in law enforcement, corrections and social service agencies, or for admission to law school.

To complete the criminal justice track:

In addition to the required core of 27 hours, students will also be required to take:

- CJ 2660 Criminology
- CJ 2700 Introduction to Law Enforcement
- CJ 2850 Criminal Law and Procedure
- CJ 3610 Advanced Criminal Procedure

- CJ 3650 Juvenile Delinquency
- CJ 4660 (5660) Corrections
- PHIL 1030 Introduction to Philosophy
- POLS 1030 American Government

Students will complete an additional 12 hours of elective courses **at the upper division level** chosen from courses with a sociology, criminal justice, or social work prefix.

Total hours in the major: 63

Total hours of sociology/SW/CJ courses: 45-54.

Total hours required for graduation: 120.

- English-upper division course Credit 3.

Total departmental requirements for the major: 54 hrs

To complete the social work track:

In addition to the required 27 hours, students will also be required to take:

- SW 1800 Introduction to Social Work
- SW 4100 (5100) Probation and Parole
- SW 4120 (5120) Case Management
- SW 4900 (5900) Internship
- PHIL 2250 Introductory Ethics
- POLS 1030 American Government
- PSY 1030 General Psychology
- PSY Additional Course or EDPY 2210 Educational Psychology (3)

Students will complete an additional 15 hours of elective courses chosen from courses with a sociology, criminal justice, or social work prefix. A **minimum of 9 hours** must be at the upper division level

Total hours in the major: 57.

Total hours of sociology/SW/CJ courses: 42-51.

Total hours required for graduation: 120.

Political Science Major

The Political Science major at Tennessee Tech University is part of a 120 hour degree program with at least 36 of the required 120 hours at the upper division level (courses numbered at the 3000 or 4000 level). The Political Science Major at Tennessee Tech University leads to the Bachelor of Science Degree and includes three tracks: a Bachelor of Science in Political Science; a Bachelor of Science in Political Science with a concentration in Legal Studies; and a Bachelor of Science in Political Science with a concentration in International Relations and Comparative Government.

The departmental requirements for the major consist of a total of 54 hours including:

- POLS 1000 - American Government Credit 3.
- POLS 1100 - Introduction to Political Science Credit 3.
- Electives in Political Science Credit 24.
- Foreign Language Credit 6. (At least 3 hours must be in a language course. The other 3 hours may be in language or in a culture related course.)
- Computer skills—DS 2810 - Computer Applications in Business Credit 3. or CSC 1100 - Introduction to Computing Credit 3.
- History—upper division course Credit 6.
- Social Science, Criminal Justice, or Philosophy Electives Credit 6.

COLLEGE OF BUSINESS

Thomas Payne, Dean
Jack Matson, Associate Dean
Nat Natarajan, Associate Dean

Philosophy Objectives

The mission of the TTU College of Business is to excel in preparing students for business and business-related careers by blending scholarship and business experience in quality undergraduate programs and a case-oriented MBA program.

The College's highest level of dedication is to its academic program exemplified by its focus on excellence in instruction, which is supported by a commitment to scholarly activity and intellectual contribution by the faculty and interaction with business and industry. We believe that teaching, research, and service are interdependent components of our mission. The following values guide us in striving for excellence in these three areas identified in order of relative emphasis:

Teaching--We encourage our faculty to be sensitive to the educational needs of our students and to strive for excellence in teaching skills and content.

We seek to educate business leaders and potential leaders who are capable of making lasting contributions to business and society and who are also skilled in using an interdisciplinary approach to decision making in an increasingly global and technology-dependent business environment.

Intellectual Contributions--We encourage our faculty to engage primarily in applied research and scholarly activities that provide insights into business practice. We believe such scholarly activity should be a career-long endeavor of faculty engaged in educating current and future business leaders and that such activity enhances the effectiveness of classroom instruction and external interaction.

Service--All members of the business school faculty are encouraged to share their expertise to benefit external constituencies and to offer opportunities for students and faculty to apply their skills and knowledge. We believe these activities and involvement with business and government leaders significantly increase the abilities of faculty to deliver current information in the classroom and that they build important bridges between the academic community and our external constituencies.

We encourage professional and service endeavors that strengthen relationships with the broader academic community--activities within this University, interaction with other universities, and involvement in professional organizations.

The College offers the B.S.B.A. degree that is structured on a firm base of liberal education courses, a core area of business studies, and an area of specialization. We seek to prepare students from culturally diverse backgrounds for careers in business. In the degree, the College seeks to:

1. Develop an analytical approach to sound business decisions.
2. Develop understanding and appreciation of the social, ethical, legal, political, and economic environment of business.
3. Promote appreciation of the civic and social obligations of business managers.

4. Develop understanding and appreciation of business in its international context.
5. Equip students to respond to the demands of business in a changing technological environment.
6. Create a professional attitude and provide the foundation for professional competence in a chosen career specialization.

Business Program

The business program includes studies in three major categories: general education, the business core, and a major field of specialization. The core courses and the distribution of credit hours for the three categories of studies are listed as follows:

Category
General

ECON 2010, 2020; 3320, 3810 or 3820.....	9
ENGL 1010, 1020	6
HIST 2010, 2020	6
MATH 1130, 1830	6
(8 semester hours selected with advisement from ASTR, BIOL, CHEM, GEOL, or PHYS).....	8
COMM 2025 or PC 2500.....	3
Humanities	9 ¹
Non-business Electives Credit	13 ²

Business Core³

ACCT 2110	3
ACCT 2120	3
BMGT 3510.....	3
BMGT 4930.....	3
DS 2810	3
DS 3520	3
DS 3620	3
DS 3840 or DS 3841	3
ECON 3610.....	3
FIN 3210	3
LAW 3810	3
MKT 3400	3
Major Field of Specialization⁴	21

Accounting	
Business Management or Decision Sciences	
Economics	
Finance	
Marketing	
Business Electives ²	3
Total Required for Graduation ^{3,5}	120

¹ Select from the approved list of TTU General Education courses in Humanities/Fine Arts.

² Elective courses are to be selected in consultation with the academic advisor.

³ Business students may not take business courses on a pass/fail basis.

⁴ Business majors must complete at least 50% of the upper-division hours required in the major field of specialization at Tennessee Technological University.

⁵ Business majors must earn at least 50% of the business hours required for the degree at Tennessee Technological University.

ADMISSION

See Admission for requirements for admission to the University.

COB RETENTION POLICY

Any student majoring in the College of Business must have a cumulative QPA of at least 2.0 upon reaching junior status (60 hours) to be eligible to enroll in upper-division (3000- and 4000-level) courses.

A student who does not meet these requirements must make a reasonable effort, in consultation with the advisor, to repeat 1000- and 2000-level courses as soon as the courses are next offered to bring the QPA to a 2.0.

Having met these requirements, the student must maintain at least a 2.0 overall average, as well as a cumulative 2.0 in all business courses.

A student who does not maintain these averages for any two consecutive semesters after becoming a junior will be required to repeat upper-division courses to raise the average to the required level.

All repetition of courses shall be in accordance with the university policy governing course repetition as described in this Catalog.

DIVERSITY PROGRAM

The College of Business administers a diversity scholarship endowment designed to encourage individuals of diverse backgrounds to enter the College and pursue careers in business.

REQUIREMENTS FOR DEGREE

Each curriculum in the College of Business leads to the degree of Bachelor of Science in Business Administration. To obtain a degree, the student must complete the curriculum for the major subject chosen and comply with the general requirements of the University. Advisors in the COB Student Success Center serve as academic counselors for the first two years or until Basic Business requirements have been

completed. The department chairperson, or a faculty member designated by the chairperson, serves as the student's academic advisor for the junior and senior years.

At least 50 percent of all business credit hours and 50 percent of upper-division hours in the major must be earned at Tennessee Technological University.

PRE-LAW

The pre-law student may complete the requirements for a degree in any curriculum of the College of Business with a major in accounting, business management, economics, finance, marketing, or International Business and Cultures (joint degree with the College of Arts and Sciences). A college degree and a satisfactory score on the Law School Admission Test are generally required for admission to an approved law school. The pre-law program in business is designed to supplement departmental counseling and to assist the student in planning a program for a career in law. The pre-law advisor provides the information relevant to professional law programs, admission requirements, and standards.

B.S. IN INTERNATIONAL BUSINESS AND CULTURES

This joint-degree program, shared by the College of Business and the College of Arts and Sciences, is designed to prepare American and international students for the arena of international relations and trade. Track 1, designed for American students, emphasizes competence in basic and international business, a high level of proficiency in foreign languages, and solidly grounded knowledge of foreign cultures and the world business community. Track 2, designed for international students, offers specialized concentrations in American studies and aspects of American and international business cultures. The capstone course for both Tracks 1 and 2 is a domestic or international internship (IBC 4980). Track 1 students may also choose to spend a semester or year studying abroad in order to improve their foreign language proficiency and deepen their knowledge of foreign cultures.

MASTER OF BUSINESS ADMINISTRATION

The MBA is intended for business and non-business undergraduate majors and experienced managers. For details of the MBA program, see the Bulletin of the Graduate School.

ORGANIZATION

Departments and Undergraduate Curricula

The College of Business includes the following departments, which offer curricula as follows:

Department	Curriculum	Concentrations	Degree
Accounting	Accounting		B.S.
Decision Sciences & Management	Business Management	1) Business and Information Technology 2) Business Intelligence and Analytics 3) General Management 4) Human Resource Management 5) Production & Operations Management	B.S. B.S. B.S. B.S. B.S.
Economics, Finance & Marketing	Economics		B.S.

Finance	B.S.
Marketing	B.S.
International Business and Cultures	B.S.

Individual curricula begin on Catalog page 100.
Course descriptions begin on Catalog page 189.

STUDENT SUCCESS CENTER

Julie Galloway, Director/Advisor

Advisors: Melissa Creek, Rebecca Leimer

Program Manager: Amy Jo Carpenter

Mission Statement: To support, guide, and empower students for academic and social success in their college, professional and life experiences.

All students entering into the College of Business are initially admitted as Basic Business majors and receive support services through the College of Business Student Success Center. The Center offers academic advising to Basic Business majors to ensure that preparation for upper-division students is both thorough and properly sequenced. Freshmen who begin their studies at TTU, as well as those students who transfer to the College from other majors or from other schools, are advised by the Center.

The Center also offers workshops, seminars, and special events through the Student to Career program. The purpose of the Student to Career program is to provide programming that enhances the academic and social elements of our student's college experiences as they transition from business student to business professional. Students participate in resume and interview workshops, dining etiquette training, and special events including career fairs.

The Basic Business curriculum is structured as two-years of full-time study and is the required foundation curriculum for all business majors. Transfer credits are evaluated and applied as appropriate.

Students satisfactorily completing the Basic Business program may affiliate with an upper-division major. Students must complete at least 60 semester hours, including mathematics, English, science, history, humanities, communications and all required sophomore-level business courses, with at least a 2.0 quality point average (QPA). Students should apply for affiliation with the upper-division major through the COB Student Success Center during the last semester of the sophomore year.

Transfer students remain in the division until they complete the required program. If their evaluated transcripts reveal that they have the necessary credits and QPA, they may affiliate with a major immediately. Basic Business students must complete the required program of studies before enrolling in upper-division business courses.

DEPARTMENT OF ACCOUNTING

Professor Rand, Chairperson; Professors Fesler, Seay; Associate Professor Howard; Assistant Professors Davis, Garner, Wilbanks; Instructor Waggoner

The objective of the accounting program is to provide the educational foundation for careers in accounting. The program includes both general and special education. Courses in the arts, sciences, and business areas are required. A wide variety

of accounting courses provide flexibility for different accounting specialties. The curriculum is designed to help students gain initial employment and successfully advance in such specializations as public accounting, internal auditing, taxation, and business and industrial accounting. The accounting program helps students to meet the requirements of the state's 150-hour law for CPA candidacy.

DEPARTMENT OF DECISION SCIENCES AND MANAGEMENT

Professor Timmerman, Chairperson; Chairs of Excellence Guimaraes (J.E. Owen Chair of Excellence in Management Information Systems), Reimann (W. Eugene Mayberry Chair of Excellence in Quality and Technology Management); Professors Armstrong, Miller, Natarajan (W. Eugene Mayberry Professor of Management), Wells; Associate Professors Ballou, Huguenard, Jones, Matson, Pineda; Assistant Professor Nagy; Instructor Smith

The department offers the Business Management major with a choice of four options: General Management (BUMA); Human Resource Management (BUHR); Production/Operations Management (BUPR); and Management Information Systems (BUIN).

General Management is the science of getting people and resources together to accomplish organizational goals and objectives. It can include things like planning, organizing, staffing and, most importantly, leading. General Management graduates obtain positions in administrative services management, lodging management, management consulting, meeting and convention planning, non-profit and community services administration, retail and food services management, project management, and property and facilities management.

Human Resource Management helps an organization make the best use of its most valuable asset: its people. The Human Resources function helps an organization select the best employees, develop them to meet their full potential, and reward them in ways that foster individual and organizational success. Human Resource Management graduates are hired in a wide variety of organizations including financial institutions, health care providers, manufacturing companies, and consulting firms. Entry-level jobs include recruiters, compensation analysts, and human resource assistants.

Production & Operations Management is the management of processes and operations used by businesses in the production of their goods and services. It is the study of efficiency and effectively. Manufacturing plants are the main employers of production/operations management personnel, but many service organizations, including health care organizations and banks, also hire graduates as operations analysts or quality and productivity analysts.

Management Information Systems students use information technology to solve business problems. This requires more than technical skills. Our program also

emphasizes work place skills like business concepts, critical thinking, communications, working with people, project management, and thinking strategically about technology. MIS students receive a degree in business management, so they can pursue a career that emphasizes either business or technology. Graduates often work as business applications developers, systems analysts, project leaders, database and network administrators, business consultants, and information systems managers.

In addition to offering the four options of study, the department provides a significant amount of the core coursework in organizational behavior, analytical methods, management information systems, operations management, and business strategy, to support other undergraduate majors offered in the College of Business, as well as the graduate program in business.

The department houses two distinguished professorships in the state's program of chairs of excellence allowing universities to attract eminent faculty and individuals of national and international prominence as chairholders. In the department is the J.E. Owen Chair of Excellence in Management Information Systems held by Dr. Tor Guimaraes, a scholar of international distinction. In addition, the department has the W. Eugene Mayberry Chair of Excellence in Quality and Technology Management held by Dr. Curt Reimann, senior scientist emeritus of the National Institute of Standards and Technology and retired director of the Malcolm Baldrige National Quality Award. This distinguished position is named in honor of Dr. W. Eugene Mayberry, retired chairman of the board of governors of the Mayo Clinic.

DEPARTMENT OF ECONOMICS, FINANCE AND MARKETING

Professor, Chairperson; Professors I. Anitsal, DiFurio, Isbell, Martin, Pashley, Pharr, Stephens (Senior Associate Provost for Academic Affairs), Throckmorton, Wiant; Associate Professors Alley, M. Anitsal; Assistant Professors Cole, Hales, Melichar; Lecturer Nabors

The program in economics is designed to provide a sound preparation for those who expect to pursue professional careers in economics, as well as other areas in business, and to provide service courses for non-business majors. The major emphasis is in developing an understanding of the economic environment, economic institutions, processes, and problems, as well as the basic economic models at work under a market economy.

The curriculum in finance offers a program that will assure sound preparation for those who expect to pursue professional careers in finance, as well as other business. The program is designed to provide a solid understanding of the financial decision-making process, with special emphasis on computer-assisted decision making. The curriculum is designed to enable the student to successfully gain initial employment in the areas of banking, real estate, insurance, investments, financial planning, and financial management.

The marketing major is created to provide students with a broad understanding of the factors and activities involved in the product management, distribution, promotion, and pricing processes. The major prepares students for careers in product and brand management, sales, advertising, retailing, industrial marketing, marketing research, customer service, and physical distribution. The curriculum is designed to include a

comprehensive study of manufacturers, wholesalers, retailers, small businesses, service firms, and non-profit organizations.

COLLEGE OF EDUCATION

Lisa Zagumny, Dean
Julie C. Baker, Associate Dean

Departments and Programs**ORGANIZATION**

The College of Education consists of three diverse departments, offering a variety of bachelor's, master's Specialist and PhD degrees. The academic units are Counseling and Psychology, Curriculum and Instruction, and Exercise Science, Physical Education and Wellness (EXPW). The majority of the College's degrees offer a teacher licensure component and it is the largest graduate college.

The College also operates four support units. A Director heads each division. These are the Child Development Lab, the College of Education Student Success Center, the Learning Resources Center, and the Office of Teacher Education. Additionally, the College offers an off-campus 2+2 program elementary education majors at 8 sites across Tennessee.

Programs within the College are accredited by:

- Council for the Accreditation of Educator Preparation (CAEP)
- National Association of School Psychologists (NASP)

PURPOSES

1. Prepare caring and competent professionals in teaching, school leadership, counseling, psychology, music and art.
2. Provide a high quality preparation program for doctoral students in Applied Behavior Analysis, Literacy, Program Planning and Evaluation, and STEM Education.
3. Ensure the success of developmental students in their majors.
4. Provide a model childhood development laboratory.
5. Provide cultural events through the Fine Arts for the Upper Cumberland, the state and the region.

ADMISSION TO THE COLLEGE OF EDUCATION

The undergraduate curricula in the College of Education lead to the degree of Bachelor of Science, Bachelor of Science in Education, Bachelor of Music, or Bachelor of Fine Arts. Each candidate must complete the curriculum for the major subject and must comply with university requirements for a degree.

Students receive provisional admission upon meeting the admission policies of the institution. For licensure students, admission to the Teacher Education Program requires additional criteria. Check <https://www.tntech.edu/education/teachered/admission-to-tep/> for admission to the Teacher Education Program.

Department	Curriculum	Concentration	Degree
Counseling and Psychology	Psychology		B.S.
Curriculum and Instruction	Early Childhood Education	Early Childhood Education/PreK-3	B.S.
		Non-Licensure	B.S.
			B.S.
	Elementary Education		B.S.
		English as a Second Language/PreK-12	B.S.
		General (non-licensure)	B.S.
	Multidisciplinary Studies	Middle School English, 6-8	B.S.
		Middle School Math, 6-8	B.S.
		Middle School Science, 6-8	B.S.
		Middle School Social Studies, 6-8	B.S.
		Non-Licensure	B.S.ED.
		Specific Teaching Field	B.S.ED.
	Special Education	Comprehensive	B.S.
		Non-Licensure	B.S.
		SE Interventionist Biology, 6-12	B.S.
		SE Interventionist English, 6-12	B.S.
		SE Interventionist K-8	B.S.
		SE Interventionist Math, 6-12	B.S.
		SE Interventionist Social Studies/History, 6-12	B.S.
Exercise Science, Physical Education and Wellness	Exercise Science, Physical Education and Wellness	Fitness and Wellness	B.S.
		Licensure (K-12)	B.S.

Pre-Athletic Training	B.S.
Pre-Occupational Therapy	B.S.
Pre-Physical Therapy	B.S.
Pre-Physician Assistant	B.S.
Recreation and Leisure	B.S.
Sport Administration	B.S.

Individual curricula begin on Catalog page 100.
Course descriptions begin on Catalog page 189.

COLLEGE OF EDUCATION STUDENT SUCCESS CENTER

Go to <https://www.tntech.edu/education/edadvising/> for information for the College of Ed Student Success Center.

OFFICE OF TEACHER EDUCATION

Go to <https://www.tntech.edu/education/teachered/> for information for the Office of Teacher Education.

LEARNING RESOURCES CENTER LIBRARY

Go to <https://www.tntech.edu/education/lrc/> information for the Learning Resources Center Library.

DEPARTMENT OF COUNSELING AND PSYCHOLOGY

Professor Stein, Chairperson; Professors Cupp, Terneus, Zagumny; Associate Professors Foster, Wilcox; Assistant Professors Burgin, Dukewich, Loftis, Luke, Malone, Michael; Lecturers Edwards, Hensley

The Department of Counseling and Psychology offers the program leading to the degree of Bachelor of Science in Psychology, psychological foundations courses for teacher education, and graduate programs leading to the Master of Arts and Specialist in Education degree in Educational Psychology and Counselor Education.

DEPARTMENT OF CURRICULUM AND INSTRUCTION

Professor J. Wendt, Chairperson; Professors Akenson, Anthony, Brashears, Comer, Dainty, Graves, Kolodziej, Larimore, Owens, Setliff, M. R. Smith, Zagumny; Associate Professors J. Baker, Beach, Bruckman, Chitiyo, Howard, J. Lloyd, Martin, O. Martin, S. J. Smith, Suters, Trent; Assistant Professors J.C. Baker, Isbell, King, McCormick, Ogbomo, Richards, Stepp, Taylor-Greathouse, S. Wendt; Lecturers Callender, Edwards, Kennedy, Lafoon, Moore, Rogers, Taylor

The Department of Curriculum and Instruction is responsible for preparing teachers for endorsement in one or more teaching fields or grade levels in Pre K-12 and for offering graduate work in instruction and curriculum through the M.A. and Ed.S. degrees. Licenses for teaching are available in the areas of:

Early Childhood Education, Pre K-3 and Early Childhood Special Education, PreK-3
Elementary Education

English as a Second Language

Middle School, 6-8

Secondary Education (Biology, Chemistry, Earth Sciences, Economics, English, French, German, Geography, History, Mathematics, Physics, Political Science, Psychology, Sociology, Spanish, Speech Communication, 7-12, and Theatre, K-12) and Trade and Occupational Specialist specialization

Special Education (Comprehensive K-12)

The Department of Curriculum and Instruction offers graduate programs in each of the above areas as well as in the field of Curriculum, Instructional Leadership, Reading Specialist, and Library Science.

The Multi-disciplinary Studies Non-Licensure program is offered for students desirous of a broad-based degree and background in education but who do not desire to pursue a teaching license.

Occupational Education

No degree is available; however, course work is offered for the occupational teacher who must complete specific knowledges and skills to be recommended for the Occupational Education License. The program consists of the following 18 semester hours: CTE 3230, CTE 4030 (5030), CTE 4080 (5080), CTE 4090 (5090), CTE 4850 (5850), and SEED 4121 (5121).

The initial license issued is the Apprentice Occupational License. To advance from the Apprentice Level to the Professional Level, the individual must attend a three-day or 18 contact hour pre-service training for occupational teachers during the first year, earn 18 semester hours from an institution with an approved program (with six of those hours required during the first year), complete four days of observation of other teachers, have a mentor teacher, attend two days of professional development during the school year, and must teach a total of three years with positive evaluations by the local education agency.

DEPARTMENT OF EXERCISE SCIENCE, PHYSICAL EDUCATION AND WELLNESS

Associate Professor Killman, Chairperson; Professor Bell; Associate Professor Phillips; Assistant Professors Hauser, Rosemond, Instructor Smith

The primary goal of the Department of Exercise Science, Physical Education and Wellness is to prepare future professionals in the fields of teaching, coaching, fitness, wellness and rehabilitation. The secondary goal is to help

students understand the benefits of a physically active lifestyle and to develop healthy behaviors for life.

With a degree in Exercise Science, Physical Education and Wellness, one can:

- Teach lifetime wellness in public schools
- Teach physical education K-12
- Coach or be a sport administrator
- Work in or lead a fitness and wellness program in a corporate, hospital or private setting
- Continue their education towards licensure as a physical therapist or an occupational therapist

Students intending to major in Exercise Science are expected to exhibit a healthy level of physical fitness. All majors must take and satisfy the requirements of a departmental Physical Fitness exam annually. Failure to pass this exam will result in an administrative change of major.

COLLEGE OF ENGINEERING

D. Hoy, Interim Dean
V. Motevalli, Associate Dean for Research and Innovation
J. Matson, Assistant Dean for Assessments
T.D. Marable, Director of Diversity
H. Ingle, Director, Student Success Center

VISION

21st Century Renaissance Engineers Revolutionizing Engineering to Solve Societal Problems

MISSION

To graduate innovative engineers who solve technological challenges to meet societal needs.

CORE VALUES

The college core values underscore and support its vision and mission through its commitment to ASPIRE to greatness.

AIM HIGH

We aim for the highest levels of excellence in teaching and scholarship.

STUDENTS FIRST

We place the interest of the students first.

PROFESSIONALISM

We foster high standards of integrity and professionalism.

INNOVATIVE

We strive continuously for innovations through research to attain excellence in everything we do.

RECOGNITION

We recognize efforts that accelerate us towards our vision.

EMINENCE

We drive towards attaining eminence in engineering education and research.

UNDERGRADUATE STUDIES

The College of Engineering offers seven programs with curricula leading to Bachelor of Science degrees in Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Mechanical Engineering, Computer Science, and Engineering Technology. Most students entering the College may select a particular major. However, if a student is not sure which major to enter, a common first-year curriculum for most majors is provided by the Basic Engineering Program, allowing additional time for the student to select a field of specialization.

The undergraduate programs in Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>). The Computer Science program (Computer Science, Software and Scientific Applications) is accredited by the Computing Accreditation Commissions of ABET (<http://www.abet.org>). The Manufacturing and Engineering Technology program is accredited by the Engineering Technology Accreditation Commissions of ABET, (<http://www.abet.org>).

GRADUATE STUDIES

The College of Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees.

The Master of Science, a research-oriented degree program, is offered with majors in Chemical Engineering, Civil Engineering, Electrical/Computer Engineering, Computer Science and Mechanical Engineering. Some programs include a non-thesis option. A full-time student usually completes the degree in 18 to 24 months.

The Doctor of Philosophy, coordinated by the Associate Dean for Academic Affairs, is under the direction of faculty advisory committees which are interdepartmental in nature. A highly qualified student, possessing an M.S. degree in Engineering, will normally need three to four years of full-time study to complete the degree.

For more information see the [Graduate Catalog](#).

THE COOPERATIVE EDUCATION PROGRAMS

Students of all curricula of the College of Engineering are eligible to participate in the University's Cooperative Education program. This program is one in which classroom study is integrated with practical industrial experience in an organized program under which students alternate on-campus study with off-campus employment in industry or with a governmental agency.

A student on the cooperative education program must complete the same course work as required of the regular four-year students. For a common program, a student initially attends college full-time for three semesters, has an off-campus Co-op assignment for one to three semesters, returns to the campus for two or three semesters, has a second off-campus Co-op assignment, and then returns to the campus to complete graduation requirements. The Co-op program provides an excellent hands-on experience, but usually adds one or two additional years to complete the BS degree requirements. See [Cooperative Education](#) for more details.

DIVERSITY PROGRAM

The College of Engineering is committed to the development of a diverse student body through scholarships and awareness programming. The strategic goal is to lead among peers in the quality and diversity of the student body, and in retention and graduation rates. Programming strategies include: Summer Bridge program, Peer Mentoring, Cooperative Education, Internship Experiences, Study-Abroad

Opportunities, Ongoing Student Support, Assistance with Graduate School entrance, and Career Advisement.

CENTERS OF EXCELLENCE

The College operates three State- or NSF-supported accomplished Centers of Excellence: the Center for Manufacturing Research; the Center for Energy Systems Research and the Cybersecurity Education, Research, and Outreach Center. These Centers provide financial support and state-of-the-art facilities for undergraduate and graduate research projects.

ADMISSION OF FRESHMEN

In addition to meeting the requirements for admission to the University, students seeking admission to an Engineering major must have at least a 3.0 high school average and must have achieved a composite score of at least 20 and a mathematics subtest score of at least 22 on the ACT Test. It is advisable for engineering students to have completed 4 units of science (including physics, if possible) and at least 3 1/2 units of college preparatory mathematics, including a study of trigonometric identities, in high school. Applicants who have met the necessary prerequisites and have scored at least 27 on the mathematics ACT subtest will be admitted to Calculus I (MATH 1910). Precalculus courses (MATH 1710, MATH 1720, or MATH 1730) or other math courses intended as preparation for MATH 1910 may not be utilized to satisfy any curricular requirement for graduation in an Engineering major. Students with less than the recommended preparation in mathematics are encouraged to enter the College of Engineering during summer semester immediately following high school graduation. Course offerings are normally available during the summer semester for students with deficiencies and for students who wish to begin their studies early.

Students selecting the Engineering Technology curriculum must have completed two units of high school algebra.

ADMISSION OF TRANSFER STUDENTS

In addition to meeting the requirements for admission to the University, transfer students seeking admission to an Engineering major must have

- a cumulative higher education QPA of at least 2.0 (excluding credit for remedial and developmental courses) and
- a grade of "C" or higher in a pre-calculus mathematics course that includes a study of the trigonometric identities.

The College of Engineering will assist transfer students in making the transition to Tennessee Tech at any point in their academic programs.

These requirements also apply to current TTU students desiring to change their major from a non-engineering program to Engineering. Tennessee Tech's engineering curricula are designed so that the needs of students who choose to initially attend a community college or other college/university not offering a B.S. engineering program may be met. Students who complete the following list of approved courses at another institution may complete curricular requirements for a B.S. degree in Engineering at Tennessee Tech in approximately two years.

Students who wish to transfer to the Engineering Technology program should consult with the Chairperson of the Department of Manufacturing and Engineering Technology.

B.S. DEGREE AND GENERAL EDUCATION REQUIREMENTS

The student must complete the curriculum for the major subject chosen and must comply with General Requirements for a Baccalaureate Degree and the General Education Requirements. However, students majoring in engineering who completed one unit of American history in high school are exempt from the requirement of six semester hours of American history. Computer Science and Engineering Technology majors are not exempt and must take American History. If a student is deficient in high school history, the student must remove the deficiency by earning credit in HIST 2010 and 2020 before earning 60 credit hours. This includes most international students.

Studies in the General Education Requirements serve not only to meet the objectives of a broad education but also to meet the objectives of the professional accreditation agencies ABET and ATMAE. In the interest of making engineering/computer science/technology students fully aware of their social responsibilities and their ability to consider related factors in decision-making, courses in the humanities/fine arts and the social/behavioral sciences are required. Each student is obligated to understand these requirements and know any special requirements within their particular major.

The courses offered in the "major subject" (used to calculate Major QPA) include all courses taken which bear the student's departmental designation. This excludes courses listed as not for credit for these students. For computer engineering, ECE and CSC courses will constitute the "major subject."

ADVISING

Advising, both curricular and career, is considered to be a very important aspect of student success. Advising in College of Engineering is provided by both the professional advisors of the Clay N. Hixon Student Success Center, as well as the faculty and chairs of the academic departments. Students are strongly encouraged to seek out help from the College's advising resources whenever needed or desired.

ORGANIZATION

Departments and Undergraduate Curricula

The College of Engineering includes the following departments which offer curricula as follows:

Department	Curriculum	Concentration	Degree
General and Basic Engineering	Engineering		B.S.
Chemical Engineering	Chemical Engineering	Bio-Molecular Engineering	B.S., M.S.Ch.E.
Civil & Environmental Engineering	Civil Engineering		B.S., M.S.C.E.
Computer Science	Computer Science	Cyber-Security Data Science High Performance Computing Software & Scientific Applications	B.S.
Electrical & Computer Engineering	Computer Engineering		B.S. Cmp.E.
	Electrical Engineering	Mechatronics	B.S., M.S.E.E.
Mechanical Engineering	Mechanical Engineering	Mechatronics	B.S., M.S.M.E.
College of Engineering	Chemical, Civil, Electrical, and Mechanical Engineering		Ph.D.
Manufacturing & Engineering Technology	Engineering Technology		B.S. E.T.

Individual curricula begin on Catalog page 100.

Course descriptions begin on Catalog page 189.

GENERAL AND BASIC ENGINEERING**Assistant Professor Craven, Interim Chair; Assistant Professor Wells; Lecturers Baswell, Hill, S. Wells**

The Department of Basic Engineering at Tennessee Technological University serves two purposes associated with two different cohorts of students. One cohort will consist of students seeking a Bachelor of Science in Engineering degree, a joint degree program with East Tennessee State University (ETSU). The other cohort will consist of incoming students who have not yet chosen a specific engineering discipline.

The Bachelor of Science in Engineering degree is a general engineering degree that includes coursework in several engineering disciplines. The general engineering area is one of the more rapidly growing engineering degrees in the United States with many similar programs already in existence. Students graduating with a major in Engineering will be prepared to use their focused study in math, science, and engineering to solve problems and design solutions in a variety of industries and settings. The multi-disciplinary nature of the program will prepare students to serve needs in general manufacturing, technical services, construction, and engineering management.

The joint Bachelor of Science in Engineering program offered through TTU and ETSU is composed of 128 credit hours. The coursework includes: 36 credit hours of General Education; 22 - 24 credit hours of mathematics and science; 54 credit hours of engineering; 12 credit hours of technical electives; and 2 - 4 credit hours of other electives.

The primary mission of the Basic Engineering Program is to provide an initial major for entering students who have not

decided on a specific engineering discipline. This is a common situation for many entering students, who often have not had sufficient exposure to the various engineering disciplines to make a selection. Students who are eligible for admission to the College of Engineering may choose to major in Basic Engineering during their first year. Advising staff in the College of Engineering Students Success Center will advise these students and assist them in the selection of a degree-granting major.

The Basic Engineering Program also provides academic and administrative support to the degree-granting programs in the College of Engineering. Academic support includes courses in engineering graphics, computer programming, and connections to engineering and technology. All courses are designed to prepare TTU engineering majors with the foundation knowledge and skills required to succeed in an engineering baccalaureate degree program. The administrative support functions vary by degree-granting program and include recruiting activities, mathematics placement testing, registration activities, transfer credit evaluation, student advisement, and student records management.

The Basic Engineering curriculum covers the freshman year and includes:

- fundamental subjects, such as calculus, chemistry, and English writing;
- engineering skills, such as engineering graphics and computer programming;
- two elective courses in the area of humanities and fine arts; and
- engagement in meaningful academic and non-academic, out-of-the classroom activities.

The freshman year curricula for Civil Engineering and Mechanical Engineering are nearly identical to the Basic

Engineering curriculum. The freshman year curriculum for Chemical Engineering does not require the engineering graphics course but includes CHE 1510. The freshman year curricula for Computer Engineering and Electrical Engineering do not require engineering graphics, replaces the second semester of chemistry with the first semester of calculus-based physics (with the lab), and substitutes the engineering computer programming with computer science programming. Basic Engineering students may change majors to any degree-granting department in the College of Engineering at any time. Basic Engineering students may not register for upper division engineering courses (3000 and 4000 level). The chairperson of the department in which the upper-division course is taught, with the approval of the Interim Chair for of General and Basic Engineering may grant an exception for unusual circumstances.

Students entering the Basic Engineering Program are considered to have simultaneously entered the curriculum of any degree-granting program in the College of Engineering and may graduate by satisfying the requirements of the catalog then in effect.

DEPARTMENT OF CHEMICAL ENGINEERING

Professor Arce, Chairperson; Professors Biernacki, Stretz; Associate Professor Lapizco-Encinas; Assistant Professors Arias-Chavez, Pascal, Sanders, Rice, Rice-York (Center for Manufacturing Research), Zhang

Chemical Engineering (ChE) is a respected and ideal profession for modern times and dynamic changing markets. It is broad, adaptable to a large family of businesses (i.e., petroleum, environmental, biotechnology, biomedicine, pharmaceutical, materials, food and others) and highly paid. Rooted in basic sciences, ChE is mainly concerned with the design, scaling (up or down), operation and control of the transformation and separation of raw materials into valuable products. Chemical Engineers are the inventors of nylon fibers, artificial heart valves, nasal drug deliveries and efficient processes to clean our environment, to name a few.

The Department of Chemical Engineering at Tennessee Tech is a vibrant community of engineering educators where both teaching and research synergistically work to effectively enhance student learning. In fact, Tennessee Tech is the home of some of the top educators in the region with most of the ChE Department engaged in active research on various aspects of student learning. These efforts have led to multi-award winning distinctions university-wide, nationally and internationally. ChE faculty members are frequently invited to conduct training workshops for colleagues in the United States and abroad and, therefore, students are exposed to some of the most effective and modern approaches in engineering education. The ChE curriculum is often revised to reflect changes in teaching pedagogy as well as shifts in the areas that hire our graduates, such as biotechnology, materials, and the environment. Thus, Chemical Engineering at Tennessee Tech offers a well-rounded, competitive and modern curriculum highly adaptable to the changing markets of the present time.

For those interested in industrial careers, the Tennessee Tech experience has proven successful in a variety of businesses and national labs, such as Eastman, DuPont, Proctor & Gamble, Pharmacia, International Paper and Saturn, among others, as well as the Environmental Protection Agency

and the Department of Energy (Oak Ridge). For those more interested in graduate education, Tennessee Tech graduates can be found at some of the most prestigious universities in the country and have received fellowships from competitive agencies such as the National Science Foundation and Tau Beta Pi.

The Department of Chemical Engineering offers programs leading to the degrees of Bachelor of Science, Master of Science in Chemical Engineering, and Doctor of Philosophy in Engineering. The undergraduate chemical engineering program is accredited by ABET's Engineering Accreditation Commission and the American Institute of Chemical Engineers. Two options are offered, both standard as well as biomolecular concentration. Additionally, for those more motivated and qualified students, a distinction in the major option is available to enhance the B.S. degree as well as a fast-track (5-year) B.S./M.S. option.

The mission of the Chemical Engineering Department at Tennessee Tech is to prepare relevant and adaptive chemical engineers in state-of-the-art areas by emphasizing real world problem solving and critical thinking skills.

Students majoring in Chemical Engineering must meet the College of Engineering requirements for a Bachelor of Science degree as well as the Accreditation Board for Engineering and Technology requirements. Students majoring in chemical engineering take courses in composition, literature, humanities, social science, mathematics, physics and chemistry. Students are required to take more than 40 hours of chemical engineering core courses including Material and Energy Balances, Thermodynamics, Transport Processes, Process Control, Reaction Kinetics and Process Design. In order to relate theory developed in classroom environments to practical application, most chemical engineering classes have an integrated lab experience. Nine hours of technical electives are also required that allow the student curricular flexibility.

Owing to the increased level of regional and national interest in bio-related fields within chemical engineering (bio-fuels, pharmaceuticals, etc.), the Department of Chemical Engineering now offers a "Bio-Molecular Engineering Concentration". Students graduating with Bio-Molecular Engineering Concentration will still receive a B.S. Chemical Engineering degree (and take all of the core chemical engineering classes), but will have extensive exposure to bio-related courses (cell biology, biochemistry, microbiology, biological processes in chemical engineering, etc.). Note that students enrolling in the Bio-Molecular Engineering Concentration will not encounter any additional credit hour burden.

In addition to a vibrant, graduate-level research program, the Department of Chemical Engineering offers many opportunities for undergraduate research for freshmen through senior students. Such recent topics include micro devices, materials fabrication, nanoparticles, fuel cells, and molecular-level compound design, among others. Students have the opportunity to present their work at regional and national conferences as well as become co-authors in refereed journal publications. Performing undergraduate research is one of the most successful roads to graduate school for an M.S. or a Ph.D. degree. A number of our recent B.S. graduates have continued their graduate studies at Tech, while others have entered graduate programs at universities like Georgia Tech and MIT.

**DEPARTMENT OF CIVIL AND ENVIRONMENTAL
ENGINEERING**

Associate Professor Mohr, Interim Chairperson; Professors Badoe, Crouch, Henderson, Huo, (Associate Vice President for Academic Affairs), Liu, Matson, Otuonye (Associate Vice President for Research and Graduate Studies), Smith; Associate Professors Click, Kalyanapu, Ramirez, Ryan, Weathers; Assistant Professors Datta, VandenBerge, Yarnold

The Department of Civil and Environmental Engineering offers programs leading to the degrees of Bachelor of Science, Master of Science in Civil Engineering, and Doctor of Philosophy in Engineering. The principal mission of the Civil Engineering program is to offer the strong academic program needed to produce well-educated students who can become productive members of the civil engineering profession. This mission is consistent with the academic component of the University's mission, which is in part to provide a strong academic program in engineering. To achieve this mission, the undergraduate program is structured to provide an education consisting of mathematics, basic science, engineering sciences, engineering design, humanities and social sciences consistent with accreditation standards and national needs. The civil engineering component of the program is designed to provide a broad foundation by requiring course work in structures, environment, geotechnics, materials, hydraulics, surveying, and transportation. Design-based instruction is required to provide students with the opportunity to prepare professionally for the diverse opportunities available to them.

The goal of the undergraduate Civil Engineering program is to instill in our graduates the knowledge, skills, attitude, and ethical values necessary to be successful practitioners who are able to impart positive social impacts at the state, regional, national, and international levels. The greatest desired impacts are expected at the state and regional levels. Additionally, we seek to provide the necessary academic background for civil engineering graduates pursuing advanced degrees.

The CEE Program Educational Objectives, which describe the professional accomplishments that graduates should achieve at various stages of their professional career, are as follows:

1. Graduates should demonstrate the ability for early career professional growth based on their grasp of fundamental concepts in civil engineering. *Within the first few years after graduation, CEE graduates should be employed by an organization that serves the profession or enrolled in postgraduate studies. They should be participating in engineering practice based on their academic foundation.*
2. Graduates should utilize knowledge and skills to participate in civil engineering design and/or management processes. *About five years beyond graduation, CEE graduates should be participating effectively in design processes and developing civil engineering solutions within a team setting. They are expected to be engaged in management and leadership roles for civil engineering projects and to assume positions of greater responsibility to the profession and public.*

3. Graduates should develop professionally through a commitment to life-long learning. *At all stages, CEE graduates should exhibit their potential for a sustained productive career through life-long learning. They should continue the professional registration process if necessitated by employment.*

Achievement of the department's goal and objectives are assessed through various measures. Current assessment measures include course portfolio, graduating senior exit survey, college base exam, Co-Op participant survey, performance on the subject areas of the Fundamentals of Engineering Exam, alumni surveys, and feedback from employers. The assessment process enables the CEE Department to ensure that the present curriculum fully supports the desired Educational Objectives and Program Outcomes; subject to continuous verification, evaluation, and improvement by appropriate assessment.

Design is introduced at the freshman level with design projects assigned in ENGR 1110 and ENGR 1120. Lecture is used to introduce students to the design approach. Design assignments utilize both the individual and the team approach to practical problems. Problems are open-ended and include realistic constraints.

The design experience is broadened in Mechanics of Materials, CEE 3110, during the fourth semester with design-oriented homework. As proficiency in science and synthesis increases, students are guided into more complex design considerations. By the sixth semester, students are engaged in design in each area of emphasis.

The basic sciences and mathematics that were mastered in the freshman and sophomore years and the introduction to engineering topics provide the opportunity to broaden the design experience in the junior year. Six of the twelve courses selected for the junior year have design components. These are as follows: Civil Engineering Materials, CEE 3030; Computers in Civil Engineering, CEE 3100; Environmental Engineering, CEE 3413; Hydraulics, CEE 3420; Transportation Engineering, CEE 3610; and Structural Steel Design, CEE 4310. The design component of each course is carefully selected to take advantage of the student's strengths in science, mathematics and engineering topics as each is related to the content of the current course.

Evidence of the breadth and depth of the design experience continues in the senior year. The design content of CEE courses increases from 8 percent in the sophomore year to 39 percent in the junior year and 52 percent in the senior year. Several courses including those that may be taken as a sequence and/or technical elective are considered to be totally design. In addition to technical design concepts, the student applies other realistic constraints in design; namely, economic factors, safety, reliability, aesthetics, ethics and social impacts. The design component in most senior courses addresses design with applications to practical engineering problems so that the student is exposed to design experiences pertaining to his/her specific emphasis.

Senior Design Project, CEE 4950, provides a major overall design experience and is scheduled to be taken during the last semester. The course emphasizes the use of principles acquired during the previous seven semesters, and formal lectures are kept to a minimum. Students are organized into teams composed of members representing each area of emphasis in Civil Engineering to produce designs for the same

project. Each team must make its own decision as to its "best" design.

The undergraduate Civil Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Students are expected to select an area of concentration from among the following: Transportation Engineering, Structural Engineering, Structural Mechanics, or Environmental Engineering. Civil Engineering students are required to take the Fundamentals of Engineering Examination (FE) administered by the Tennessee State Board of Architectural and Engineering Examiners.

DEPARTMENT OF COMPUTER SCIENCE

Professor Gannod (Stonecipher Distinguished Professor), Chairperson, Associate Professor Talbert, Associate Chairperson; Professor Eberle, Elizandor, Scott, Siraj; Associate Professors Ghafoor, Kosa, Rogers; Assistant Professor Rahman; Instructors Boshart, Brown

The computer science curriculum is designed to educate students in the basic areas of computer science, including computer architecture, programming languages and operating systems, general approaches to problem solving and programming, as well as theoretical concepts dealing with models of computation and the design and analysis of algorithms. By appropriate choice of elective course work, the student may prepare for a career in software development for scientific/engineering applications, management decision support applications or graduate work in computer science. Graduates of the program are regularly recruited by industry, government and business for computing careers in a variety of areas including systems design and software engineering.

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Professor Johnson, Chairperson; Professors Alouani, Carnal, Mahajan, Ojo, Qiu (Center for Manufacturing Research), Radman; Associate Professors Austen, Belkacemi, Elkeelany, Hasan; Assistant Professors Anderson, Chaoui, Mahmoud

Electrical engineering and computer engineering are dynamic fields that provide great benefits to society. People's lives are touched many times daily by the products and services made possible by electrical and computer engineers. The Department of Electrical and Computer Engineering at Tennessee Technological University prepares its students for the challenges, opportunities, and rewards of these rapidly changing fields.

The mission of the department is to provide quality undergraduate and graduate education and perform research in the areas of electrical and computer engineering to enhance the competitiveness of our graduates and contribute to economic, scientific, and social development. The department strives to continuously strengthen its reputation for excellent academic programs at the regional, national, and international levels.

As part of this mission, the department offers two undergraduate academic programs, one leading to the Bachelor of Science in Electrical Engineering (B.S.E.E.) degree and the

other leading to the Bachelor of Science in Computer Engineering (B.S.Cmp.E.) degree. In addition, a concentration in Mechatronics (electronic control of mechanical systems) is available in the B.S.E.E. program. The department also offers graduate programs leading to the Master of Science (M.S.) in Electrical Engineering and Doctor of Philosophy (Ph.D.) in Engineering degrees; these programs are described in the Graduate Catalog.

The B.S.E.E. and B.S.Cmp.E. program objectives, which were formulated to meet present and anticipated student needs and satisfy University, State, and accrediting agency requirements, are:

1. Within one year following graduation, our graduates will be
 - i. Working in the field of electrical and computer engineering and/or
 - ii. Pursuing graduate studies
2. Within five years following graduation, our graduates will have:
 - I. progressed in the careers as indicated by promotions, position of leadership, awards, recognitions, entrepreneurial activities, products or processes developed, patents, and/or publications;
 - II. advanced their knowledge and expertise as measured by indicators such as continuing education, advanced degrees, or professional registration;
 - III. contributed to the profession and society as by research, national and international collaboration, professional service, community service and/or public service.

Students are required to follow an integrated curriculum of courses and experiences that lead to the achievement of these objectives. The curriculum is designed so that students will obtain state-of-the-art technical knowledge, design experience, enhanced critical thinking and problem solving skills, an understanding of ethical responsibility, and verbal and written communication skills. To maintain quality, the achievement of these objectives, and other more specific outcomes based on these objectives, is evaluated on a regular basis and the results are used to update courses and curricula.

An integrated design experience is provided to all B.S.E.E. and B.S.Cmp.E. students which begins with elemental designs in lower level courses and culminates in a year-long, comprehensive capstone design experience at the senior level. The program places considerable emphasis on laboratory experience and computer applications, and the department maintains several state-of-the-art laboratories.

Students are encouraged to develop leadership and other social skills by participating in professional and honor societies such as IEEE and Eta Kappa Nu.

High School Preparation

Engineering study requires a strong foundation in mathematics and science. Recommended high-school preparation includes Pre-Calculus, Chemistry, and Physics. In addition to technical skills, engineers must be able to communicate effectively, both in written and spoken form, and to work productively as team members. A well-rounded background in non-technical areas, including history, culture, arts, and current events, is also important.

Bachelor of Science in Electrical Engineering (B.S.E.E.) Degree Program

Electrical engineers research, design, develop, and test electrical and electronic equipment, including systems relating to communication, power generation and distribution, automation, robotics, radar, and electronic navigation. Departmental graduates are well-rounded and professionally prepared with a strong foundation in electrical engineering fundamentals. They are employed by many large and small companies such as TVA, IBM, Raytheon, Texas Instruments, ATA Arnold Air Force Base, DENSO, Schneider Electric, Nissan, and various electric utilities. Since its founding in 1942, the B.S.E.E. degree program has produced nearly 3000 graduates and has been accredited since 1966 by the Engineering Accreditation Commission of ABET (www.abet.org) or its predecessor organizations.

Students in the B.S.E.E. program are required to take chemistry, mathematics, calculus-based physics, and general education courses including English composition and literature. They take core electrical engineering courses such as circuit analysis, signals and systems, electromagnetic field theory, electronics, microcomputer systems and electronic circuits. They acquire breadth in four fundamental areas of electrical engineering and depth in at least one area. The department has expertise and offers in-depth courses in a number of electrical engineering areas: Communications and Signal Processing; Devices and Electromagnetics; Digital Systems; Power; and Robotics, Automation, and Control.

The Bachelor of Science in Electrical Engineering also offers a concentration in Mechatronics. This concentration provides a combination of electrical, mechanical, and control system engineering courses to prepare students to work on systems consisting of interdependent electrical and mechanical components. Applications of mechatronics include automobiles, robotics, and automated manufacturing systems.

Bachelor of Science in Computer Engineering (B.S.Cmp.E.) Degree Program

Computer engineers research, design, develop, and test computer and computer-based equipment such as CPUs, high-performance computers, embedded computer systems, computer-based data acquisition and control systems, computer networks, and computer graphics hardware and software. The B.S.Cmp.E. program is tailored to meet the growing demand for engineers with expertise in computer and computer-based systems hardware and software design. This program, a joint effort between the Department of Electrical and Computer Engineering and the Department of Computer Science, is designed to prepare graduates for entry into the computer

engineering profession. They are employed by many large and small companies such as ADTRAN, Boeing, IBM and TVA. Since its beginning in 1998 the program has been continuously accredited by the Engineering Accreditation Commission of ABET (www.abet.org).

Students in the B.S.Cmp.E. program are required to take chemistry, mathematics, calculus-based physics and general education courses including English composition and literature. The core consists of a combination of electrical engineering and computer science courses that provide knowledge and expertise in both hardware and software design. Upper-level courses include various electives and feature a number of design projects involving both hardware and software.

The details of the curriculum are presented elsewhere in the catalog.

DEPARTMENT OF MECHANICAL ENGINEERING

Professor Rao, Chairperson; Professors Canfield, Cui, Darvennes, Han, Hoy, Idem, Johnson, Peddieson, Sundaram, Ting, D. Wilson, Zhang, Zhu; Associate Professors Cunningham, Marquis, Pardue (STEM Center Director), C. Wilson; Assistant Professors Anton, Languri, Shirvanian; Lecturers Foote, Sinha

The Mechanical Engineering Department at Tennessee Tech aspires to be recognized globally for outstanding education and research, leading to well-qualified engineers who are adaptive professionals, inquisitive, entrepreneurial and successful in engineering practice, research, and public service.

The Department of Mechanical Engineering at Tennessee Technological University is committed to preparing its graduates for productive, professional careers in mechanical engineering. The Department offers the Bachelor of Science degree in Mechanical Engineering (B.S.M.E.). This degree program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). In addition, a concentration in Mechatronics (electronic control of mechanical systems) is available in the B.S.M.E. program.

The profession of mechanical engineering focuses on motion and the forces and energy associated with motion. It encompasses the design and analysis of machines and processes to meet the expanding needs of a changing, technological, energy-based society. Applications within the profession are diverse; consequently, mechanical engineers may find positions in many specialties. ME graduates from Tennessee Tech may find employment in transportation industries, consulting firms, governmental agencies and laboratories, manufacturing facilities, power-production industries, process industries, universities and others. The undergraduate curriculum is broad in scope and strongly based in the fundamentals essential for professional practice, life-long learning, and advanced study at the graduate level. Design is a unique element of the profession; therefore, the design experience is developed and integrated throughout the curriculum.

Mechatronic engineering is a discipline that combines mechanics, electronics, controls and computing in the design of products and manufacturing processes. The TTU Mechatronics concentration prepares engineers that are familiar and

competent with cutting-edge technology in both mechanical, electrical and computer engineering and are prepared to develop innovative products to address societal needs.

The mission of the Department, within a regional and global context, encompasses: provision for its students to prepare for a productive career in a competitive, dynamic, technologically-based society; advancement of the knowledge of mechanical engineering principles and applications; and service to the public. The Departmental mission is essential to the University-wide goal of maintaining a strong engineering program. The Department pursues the following four goals to fulfill its mission:

1. To maintain a high-quality, ABET-accredited program with an integrated curriculum. This goal is essential to prepare all graduates for entry-level professional employment and masters-level graduate studies.
2. To improve the student's ability to formulate and to express thoughts using both written and oral communication. This goal is essential to evaluate arguments and evidence from various fields of study, to discover information, and to engage in independent inquiry. In addition, this goal promotes an awareness of ethical, social and safety considerations in all engineering endeavors.
3. To enhance the student's capacity for leadership, individual responsibility and integrity. This goal should foster an appreciation and respect for new and different ideas, opinions, and abilities.
4. To develop the student's commitment to life-long learning. This goal should foster a desire to continually improve individual abilities and enhance knowledge. In addition, this goal promotes professional enthusiasm and an enhanced quality of life.

The freshman curriculum is similar for all engineering students. Here emphasis is placed on the fundamental tools of mathematics, chemistry, physics, computer programming, written communication, humanities and basic engineering. Students are introduced to the University and engineering in Connections to Engineering (ENGR 1020). In Engineering Graphics (ENGR 1110), the importance of conveying ideas via sketches and computer-aided drafting; particular points are made relevant to machine design and manufacturability. Finally, in Programming for Engineers (ENGR 1120), students learn the essentials of programming methodology in a modern programming language. The sophomore curriculum stresses the fundamental tools of mathematics, physics, and engineering sciences (statics, dynamics, mechanics of materials, and fundamentals of electrical engineering).

The junior curriculum is primarily devoted to the engineering fundamentals of thermodynamics, fluid mechanics, heat transfer, dynamics of machinery, materials and processes in manufacturing. Completing this is a mechanical engineering analysis course and machine design.

The senior curriculum contains capstone design experiences in three courses: Applied Machine Design (ME 4020 (5020)), Senior Design Project (ME 4444), and Thermal Design (ME 4720). The senior year of the ME curriculum is completed by an introduction to modeling, vibrations and controls (ME 3050) and by each student's selection, in consultation with their advisor, of 4 senior technical electives referred to as Area of Emphasis (AOE) courses. These courses help prepare the student for whatever their future plans may be in engineering.

DEPARTMENT OF MANUFACTURING AND ENGINEERING TECHNOLOGY

Professor ElSawy, Chairperson; Professors Fidan, Vondra; Associate Professor Kamal; Assistant Professor Qasaimeh

The Department of Manufacturing and Engineering Technology prepares competent technologists and applied engineering workforce dedicated to solving complex technological problems. The department is accredited by the Engineering Technology Accreditation Commission of ABET which sets standards for academic program accreditation, personal certification, and professional development for educators and industry professionals involved in integrating technology, leadership and design.

TTU's Department of Manufacturing and Engineering Technology (MET) offers a four-year degree program leading to a BS Degree in Engineering Technology with a minor in Business. The department began in 1956 within the College of Engineering and has the distinction of being accredited by ETAC of ABET. The program was accredited by Association of Technology, Management and Applied Engineers (ATMAE), previously national Association of Industrial Technology (NAIT) - since 1982 and today serves as a model for Tennessee and the nation.

The Department of Manufacturing and Engineering Technology prepares technologists for employment in manufacturing industry and management/supervisory positions. Through specialized classes, group projects, hands-on-experience, active learning and individual assignments, students learn to be creative and resourceful. Students learn public relations, personnel supervision, and problem solving through group work, instruction, and guest speakers. This background enables graduates to share the planning responsibilities of the engineer, scientist, or manager, as well as the production responsibilities of the technician, craftsman, or laborer. The Department of Manufacturing and Engineering Technology graduates are trained in group leadership and communications at all levels of the industrial workforce.

The curriculum in Engineering Technology is built upon technical education and operations, human and industrial relations, business administration, and advanced technologies. The department strives to keep the curriculum up-to-date, incorporating new technological developments as they occur. The department offers classes in materials for manufacturing as well as conventional manufacturing processes such as: metal casting, metal manufacturing technology, welding technology, foundry technology, industrial plastics, and maintenance technology. Moreover, the department offers courses in high-tech areas such as Applied Electricity and electronics, Industrial Electronics, Programmable Logic Controllers and Process Control, Computer Numerical Control Machining Practices, Computer Aided Design and Industrial Automation, which includes Robotics and Hydraulics and Pneumatics. Plant Layout and Material Handling, Industrial Communications, and Industrial Supervision enable the manufacturing and engineering technology graduates to achieve the competencies required to apply the latest technological advances in a given field.

The curriculum also emphasizes other vital areas in the industrial workplace: Operations Management, Organizational Behavior, Accounting, Human Relations, Introduction to

Psychology, Industrial Safety, Manufacturing Cost Estimating, Methods Design, and Quality Assurance six Sigma. The addition of these courses to the curriculum gives the graduates an appealing and well-rounded education. This lets potential employers know that she or he understands all of the common operations that exist within a manufacturing environment.

Professional support of any college program is a tremendous advantage to both the students and the businesses. This support is given to the Department of Manufacturing and Engineering Technology by the Advisory Board (MITAB). Nissan America, TRW, Peterbuilt, Saturn, BMW, UPS, and Advances Manufacturing Technologies, Incorporated are a few of the companies represented on the board. The advisory board is a great way to look at companies and see what they have to offer. They also provide a great collective knowledge about the industrial and manufacturing fields from which all students are encouraged to draw.

Manufacturing and Engineering Technology students are also strongly encouraged to participate in cooperative education assignments with well-respected industrial manufacturers. Qualified students gain valuable on-the-job experience while earning money to offset educational expenses.

By supplying graduates with a technical, operational, and managerial education, the Department of Manufacturing and Engineering Technology meets the needs of manufacturing industry. The wide breadth of technical positions in the industry assures the MET graduate of an interesting and challenging career. Most of the current MET students have already secured jobs by the time they graduate.

Before graduation, MET students are required to take either Certified Technology Manager (CTM) or Certified Manufacturing Specialist (CMS) examination administered by the Association of Technology, Management, and Applied Engineering (ATMAE). Historically, the outstanding pass rate of TTU students on this national examination attest the quality of the MET graduates.

COLLEGE OF FINE ARTS

Jennifer S. Shanks, Dean

Departments and Programs

ORGANIZATION

Programs within the College are accredited by:

- National Association for Schools of Art and Design (NASAD)
- National Association of Schools of Music (NASM)

Department	Curriculum	Concentration	Degree
School of Art, Craft, and Design	Art Education		B.F.A.
	Fine Arts	Clay Design Fibers Glass Metals Painting Wood	B.F.A.
Music	Music	Music Education	B.M.
		Instrumental Licensure Vocal/General Licensure	
		Performance	B.M.
		Composition Emphasis Instrumental Option Jazz Option Piano Option Vocal Option	

Individual curricula begin on Catalog page 100.
Course descriptions begin on Catalog page 189.

APPALACHIAN CENTER FOR CRAFT

Go to <https://www.tntech.edu/craftcenter/> for information for the Appalachian Center for Craft.

SCHOOL OF ART, CRAFT AND DESIGN

Associate Professor Winkle, Director; Professors Brady (Fibers), Brock (Glass), Campbell (Wood), Doubet (Art Foundations) Pitelka (Clay), Thompson (Art Education), Ventura (Art History); Assistant Professors Gallop (Design), Johnson (Painting), Randall (Metal)

The mission of the School of Art, Craft and Design is to prepare BFA majors for careers in visual art studios, design practice and art education. More broadly, the department seeks to enable students to discover creative potential, to learn skills design processes, to acquire cultural knowledge, and to develop critical faculties through visual art experiences. The Department

also seeks to instill an appreciation of visual arts in all University students, and to broaden the cultural perspective of the community, state, and region. A unique facet of Tennessee Tech is the Appalachian Center for Craft which is dedicated to promoting excellence in American craft by providing access to the highest quality professional education in studio crafts, and presenting diverse craft artists, works and events in a community arts context.

Main Campus

Associate Professor, Kimberly Winkle, Director

The nationally recognized faculty of art education, art history, art foundations, design and painting, as well as the studios, classrooms and offices for the Bachelor of Fine Arts concentrations in art education, design and painting, and the art foundations and art history curricula, are located in the Bryan Fine Arts Building and Foundation Hall.

The Bachelor of Fine Arts concentration in art education, prepares individuals to become art teachers in Grades K-12.

The program for licensure in Art Education is designed to provide students with a broad liberal arts component, a program of professional studies, and a major in the teaching field.

The Bachelor of Fine Arts concentration design prepares students to pursue a professional career in visual communications, and the concentration in painting prepares the student for a career in studio art. Students develop technical competence, experience in design and problem solving, knowledge of art history and theories of style, the application of critical thinking, and the development of an accomplished portfolio of artwork.

Craft Center
Debra Ruzinsky, Director

The primary function of the Joe L. Evins Appalachian Center for Craft is to serve the Bachelor of Fine Arts program and to offer a high quality studio art curriculum, concentrating in the craft media of clay, fibers, glass, metals, and wood. The Craft Center expands the development of contemporary expression and the lineage of craft techniques and forms, and enhances a flourishing crafts culture in the region through its academic, workshop and exhibition programs.

The Craft Center offers over 50,000 square feet of studio space in clay, fibers, glass, metal and wood, as well as 4,000 square feet of galleries, on-site housing facilities, café, and many other amenities. Located on 550 acres of woodland overlooking Center Hill Lake in Middle Tennessee, the Craft Center is 24 miles from the Tennessee Tech University campus.

The Craft Center's facilities support Bachelor of Fine Arts craft concentrations led by the nationally recognized faculty in clay, fibers, glass, metals, and wood. Fully committed to their work both as teachers and as artists, they provide excellent studio instruction in an extraordinary studio environment. Six artists-in-residence also enhance the studio and gallery offerings. Main campus art courses and the general educational curriculum of Tennessee Technological University comprise about half of this unique, top-quality educational experience.

Craft Certificate

The Craft Certificate Program is designed for those seeking a professional-level training in craft media without the objective of a college degree. This provides an especially good opportunity for those who already have a degree and wish to focus on specialized training. Students finishing the Craft Certificate Program receive a Certificate of Completion from the Craft Center. This represents a significant level of accomplishment, but it is not a college degree.

Certificate Program admission standards are the same as for the BFA degree program. Course requirements are similar to the BFA curriculum, but exclude general education courses and the BFA thesis project and exhibition. Independent study credits may, at the discretion of the faculty advisor, be applied to a studio project representing the level of accomplishment at culmination of studies. Students in the Certificate Program must maintain at least six credits of coursework per semester, and must complete the foundation requirements within the first eighteen credits in the program.

DEPARTMENT OF MUSIC

Mullen, Chairperson; Professors

Allcott (Orchestras/Violoncello), Barham (Saxophone), Chang (Violin), Danner (Theory/Composition), Hauser (Trombone/Theory), Kennedy (Voice/Opera), Lotz (Bassoon/Music History), Martin (Flute), McCormick (Jazz Studies), Morris (Tuba/Euphonium), Pulte (Voice), Shank (Music Education); Associate Professors Godes (Piano), Hansen (Horn), Harris (Band/Music Education), Sullivan (Vocal/General Music Education), Zamer (Choral); Assistant Professor Hill (Percussion); Instructor Kim (Clairnet), Rodriguez (Trumpet); Lecturer Thurmond

The Department of Music provides an intellectual and creative environment for the study and production of the performing arts. The faculty emphasizes quality instruction, in both the classroom and the studio, embraces innovation, and acknowledges the role of technology in meeting the academic and artistic needs of the students. The Department prepares students for careers in music, enables students to enrich their lives by participating in music activities, instills in all University students an appreciation of music, and broadens the cultural perspective of the community, state, and region.

COLLEGE OF INTERDISCIPLINARY STUDIES

James Gotcher, Dean

MISSION AND SCOPE

The College of Interdisciplinary Studies provides a framework for supporting innovative boundary-crossing inquiry among students and faculty. To this end, the College of Interdisciplinary Studies supports the efforts of existing cross-disciplinary programs, and envisions new programs and opportunities for research, scholarship, and service.

ORGANIZATION

Departments and Undergraduate Curricula

The College of Interdisciplinary Studies includes the following departments which offer curricula as follows:

Department	Curriculum	Concentration	Degree
Environmental Studies	Environmental and Sustainability Studies	Environmental Science Environmental Technology Society, Culture and Communication	B.S.
Interdisciplinary Studies	Interdisciplinary Studies		B.S.
Professional Studies	Professional Studies	Health Administration Information Technology International Organizational Leadership Organizational Leadership	B.S.

Individual curricula begin on Catalog page 100.

Course descriptions begin on Catalog page 189.

SCHOOL OF ENVIRONMENTAL STUDIES

Dr. Hayden Mattingly, Interim Director; Lecturer Sharpe

The School of Environmental Studies (SOES) fosters in students the desire to lead purposeful professional lives through the application of scientific principles to environmental issues within the social, political, and economic framework of our society.

Environmental and Sustainability Studies Undergraduate Program

The Bachelor of Science in Environmental and Sustainability Studies (ESS) in the School of Environmental Studies offers a broad range of cutting-edge degree options in the environmental sciences. The program, which is 120 credit hours, prepares students for meaningful careers dedicated to the study, preservation and future of our environment <https://www.tntech.edu/is/ses/ess#bsenvironmentalandsustainabilitystudies>.

- The Environmental Science concentration allows students their choice of three study options: Environmental Biology, Environmental Chemistry or Natural Resources. This opportunity teaches students the symbiotic nature of a variety of disciplines and allows them to explore and investigate environmental problems on their own and then present their findings to a diverse audience (<https://www.tntech.edu/is/ses/ess/esses>).

- The Society, Culture and Communication concentration allows students to explore how cultural values and beliefs influence the way people use the environment. Students study how organizations address environmental problems and how complex concepts regarding those issues are communicated. In this concentration, students can choose a program of study in communications and media, social science and policy, or leadership and environmental management (<https://www.tntech.edu/is/ses/ess/esscc>).
- The Environmental Technology concentration teaches students to use GIS tools (geographic information systems) in making informed environmental decisions and in modeling environmental processes. Students also explore conventional water treatment methods (<https://www.tntech.edu/is/ses/ess/esstet>).

Professional Science Master's with a Concentration in Environmental Informatics (PSM-EI)

The 33-hour PSM-EI degree offers students an interdisciplinary curriculum that combines business and science in a unique learning experience that allows students to look at environmental data in a new way and from a business standpoint (<http://www.tntech.edu/is/psm/>).

Environmental Sciences Ph.D. (EVS) Program

The School of Environmental Studies offers an interdisciplinary Ph.D. program that will help students reach their career goals in the extensive fields of environmental science. Our Ph.D. program endeavors to be more than a traditional "academic" program. The interdisciplinary faculty work with graduate students to develop the critical thinking skills necessary to solve real-world problems (<http://www.tntech.edu/is/evsphd/>).

SCHOOL OF INTERDISCIPLINARY STUDIES

Dr. Steven Frye, Interim Director/Assistant Professor; Lecturer Bull

The School of Interdisciplinary Studies is committed to providing university students with a flexible, personalized major that allows each student the opportunity to pursue his or her individual interests. The goal is for students to think creatively, integrate knowledge and skills from a variety of disciplines, and build critical thinking skills.

A major in Interdisciplinary Studies brings together two concentration areas into an integrated and personalized program of study. Concentrations are chosen from the many fields of study offered at TTU. In their last semester each I.S. major completes a culminating project where the two concentration areas are brought together in an extensive research thesis or real-world project. This capstone experience offers the opportunity to draw from and integrate the knowledge gained in both areas.

What can you do with a major in Interdisciplinary Studies? The most appropriate answer to that question may be "what can't you do with a major in Interdisciplinary Studies?" The flexibility to pursue individual interest areas allows students the opportunity to fine-tune their education to match the knowledge and skill-set needed in a variety of fields.

SCHOOL OF PROFESSIONAL STUDIES

Dr. Joe Roberts, Interim Director

The Professional Studies Program is committed to serving and providing traditional and non-traditional students with an intellectually engaging and effective undergraduate and graduate educational experience utilizing technology through on-ground, hybrid, and online delivery systems as they enhance their knowledge, analytical abilities, critical thinking, and communication skills for upward mobility in their professional field.

Bachelor of Professional Studies (BPS)

The Bachelor of Science in Professional Studies, (120 credit hours) prepares students for management and leadership positions in the fields of Information Technology, Organizational Leadership, International Organizational Leadership, or Health Administration.

- The concentration in **Information Technology** is designed to give students an overview of the IT field and to develop proficiencies in management skills as they seek to enhance their marketability in the

workplace. <http://www.tnecampus.org/programs/946/courses>

- The concentration in **Organization Leadership** is designed to facilitate the understanding of the nature of organizations and the fundamentals of leadership. <http://www.tnecampus.org/programs/940/courses>
- The concentration in **International Organizational Leadership** is designed to meet the demands of leadership across geographies, business structures, and cultures. <http://www.tnecampus.org/programs/935/courses>
- The concentration in **Health Administration** is designed to prepare individuals for an administrative career in the healthcare field. <http://www.tnecampus.org/programs/990/course>

Please note that each concentration consists of 21 hours of core requirements and 18 hours directly related to your chosen concentration.

Master of Professional Studies (MPS)

The 33-hour MPS degree specializations provide you with an opportunity to advance in your chosen career path as it encompasses business, technology, and human development strategies while teaching leadership skills and capabilities, stimulating curiosity, and creating an adaptive background necessary for shaping the direction and future of organizations. The MPS program has six concentrations areas:

- The concentration in **Strategic Leadership** prepares you to lead and adapt in today's rapidly changing professional environment. <http://www.tnecampus.org/programs/1475/courses>
- The concentration **Human Resources Leadership** prepares you to expand your career opportunities in key management roles in the field of human resources. <http://www.tnecampus.org/programs/1481/courses>
- The concentration in **Training & Development** prepares you to manage, deliver, and assess on-site training programs. <http://www.tnecampus.org/programs/1482/courses>
- The concentration in **Healthcare Administration** prepares you for a rewarding and challenging career dedicated to the vital role of enhancing the quality of care, reducing health care costs and addressing health care issues. <https://www.tntech.edu/is/sps/mps/masters-of-professional-studies-healthcare-administration>
- The concentration in **TESOL** can give you the skills and credentials needed to either teach English abroad or to teach second language adult learners in the U.S. (This program is NOT for those planning to teach ESL in public schools within the U.S.) <https://www.tntech.edu/is/sps/mps/tesol>
- The concentration in **Public Safety** can help you secure a career in homeland security, emergency management, law enforcement, corrections, military, federal agencies and more. <http://www.tntech.edu/is/sps/mps/public-safety>

Please note that each program consists of 9 hours of core requirements, 21 hours directly related to your chosen concentration, and a 3 hour culminating project.

STUDENT SUCCESS CENTER

Jeannie Smith, Director/Advisor

Advisors: Lisa Brown, Tammy Keylon

Mission statement: To provide students, especially non-traditional students, quality advisement and serve as a gateway to the University. The Student Success Center will act as a student's liaison to the University, answering their questions and acting as a representative on the student's behalf for the College of Interdisciplinary Studies.

The Student Success Center is the initial point of contact for students who are majoring in an undergraduate program offered through the College of Interdisciplinary Studies. The SSC offers one-on-one advisement to discuss career goals and explore program options in order to develop a plan of study. The SSC provides information on registration as well as the general education requirements and the academic regulations to complete a Bachelor of Science degree at Tennessee Tech University.

Each undergraduate Bachelor of Science degree offered through the College of Interdisciplinary Studies requires 41 credit hours of general education courses (English composition, Literature, Oral Communications, American History, Social and Behavioral Science, Humanities, Mathematics, and Natural Science) and 45 credit hours of upper division courses (3000-4000 level) with at least 12 credit hours at the 4000 level. The remaining hours, 34 credit hours, of any level elective credit to total the requirement of 120 credit hours. Transfer students may transfer up to 60 credit hours from a 2-year community college. At least 60 credit hours must be completed at a 4-year school and at least 30 hours completed at TTU. Students must meet the University Requirements for a Baccalaureate Degree at Tennessee Tech University.

EXTENDED PROGRAMS AND REGIONAL DEVELOPMENT

<http://www.tntech.edu/eprd/home/>

Extended Programs and Regional Development (EPRD) is a University-wide outreach and service unit which promotes educational, social, economic, and cultural development and welfare in Tennessee, particularly in the Upper Cumberland region and surrounding counties. One way this mission is carried out is through the delivery of credit and non-credit offerings both on-campus and at off-campus locations throughout the service area and beyond. These offerings are delivered both on-site and via various distance learning delivery methods. Partnering with academic and administrative units, highly qualified personnel from business, industry, and various educational agencies are utilized to provide direction and instruction for conferences, seminars, workshops, and special events.

Non-Credit Offerings

<http://www.tntech.edu/noncredprog/home/>

Non-Credit courses are offered to meet the needs of individuals, groups, and organizations both on-campus and off-

campus. In most cases, participants need not satisfy specific educational requirements for admission to courses. Continuing Education Units (CEU's) are awarded and recorded for many non-credit courses, while others are offered strictly on a non-credit basis. Fees for non-credit courses vary and are based upon the cost of offering the course. Non-credit courses include life long learning classes for personal and professional enrichment, Youth University programs, and a host of online courses and certificate programs.

Workshops/Conferences/Special Events

<http://www.tntech.edu/eprd/specialevents/>

Extended Programs and Regional Development collaborates with campus colleges/departments and community partners to offer credit and non-credit special events. Campus partners involved in typical events include: the College of Education; the College of Business; the College of Arts & Sciences; the Millard Oakley Science, Technology, Engineering, and Math (STEM) Center; and Information Technology Services. Community partners include: the State Department of Education; the Upper Cumberland Chamber Executive Association; the Upper Cumberland Study Councils for School Directors, Principals, and Supervisors; and numerous other Upper Cumberland community service agencies.

WHITSON-HESTER SCHOOL OF NURSING

Professor Hanna, Dean; Associate Professors Geist, Hellman, Hurley, Russell; Assistant Professors Duvall, Hall, Howard, Jared, Mabry, Piras, Reeves, Turpin; Lecturers Fornehed, Roberts

The Bachelors of Science Nursing degree provides a high quality professional nursing education with emphasis on meeting health needs of rural and semi-rural communities. Specifically, the program provides opportunities for students to develop knowledge, attitudes, and skills that form the basis for professional nursing practice. The program emphasizes the utilization of the nursing process, which includes critical thinking and decision-making in planning, implementing, and evaluating health care services.

The curriculum is designed to prepare the generalist professional nurse to function in and contribute to the delivery of health care services to individuals, families, and groups in homes, clinics, hospitals, nursing homes, schools and community health care settings. The first two years provide a basic foundation in the physical and social sciences, humanities, nutrition, as well as an introduction to nursing.

The five semesters of upper division comprise the professional nursing major with its focus on the understanding and the application of the nursing theory, nursing process, scientific principles, and the research process to health promotion, disease prevention, and care of the sick. The clinical practica utilize major hospitals, mental health facilities, primary care centers, community and state health departments, private health care offices, and other agencies in the Upper Cumberland region and occasionally in urban settings. Students must meet academic requirements as well as requirements for performance in clinical practice. These requirements are found in the **TTU School of Nursing Student Handbook** and course syllabi.

Freshmen entering the nursing program (Lower Division Nursing) follow a three to four-semester directed plan of study that prepares them to apply for acceptance into Upper Division Nursing. Students may also apply to the Upper Division Nursing after completing the pre-requisite courses at a liberal arts or junior college.

The TTU School of Nursing has articulation agreements with Tennessee Board of Regents Community Colleges offering "Associate of Applied Science Degree in Nursing" and general education courses required for the TTU School of Nursing curriculum. The detailed agreements are available at www.tntech.edu/transfer.

When two candidates for admission are equally qualified, preference for admission to Upper Division will be given to students at TTU, to transfer students from TBR colleges, and to those who are Tennessee residents.

Candidates apply to the School of Nursing by February 1 for admission to the following Fall Upper Division second-semester Sophomore level or August 1 for acceptance to the following Spring Upper Division second-semester sophomore level. The School of Nursing Admissions and Credits Committee implement the admission process. While candidates are required to have a minimum of 3.0 quality point average (QPA) in all university course work to compete for admission to Upper Division Nursing, it is recommended students maintain at least a 3.2 to be competitive. Also, candidates must complete all

required courses in Lower Division prior to entering into Upper Division, fulfill health records documentation requirements and have a cleared background check. Conditional acceptance may be given to candidates completing required Lower Division course work prior to Upper Division entry. Admission to Upper Division Nursing is limited to space available. Students must have a valid Basic Life Support CPR Certification for Health Care Providers prior to or upon entry into Upper Division Nursing.

Students must attain a grade of "C" or better in each required social, physical science, and nursing course.

A comprehensive overview of admission, progression, and retention policies for the program are in the **School of Nursing Handbook**. The **Handbook** can be accessed on the TTU School of Nursing web page <http://www.tntech.edu/nursing/home/>

The School of Nursing is fully accredited by the Commission on Collegiate Nursing Education (One Dupont Circle, Suite 530, Washington, DC 20036-1120, 202-887-6791), and approved by the Tennessee Board of Nursing. Graduates may be admitted to the examination for license to practice as registered nurses (R.N.) following successful completion of the BSN.

Registered nurses who have a diploma or associate degree and are currently licensed or eligible for licensure in Tennessee; or are concurrently enrolled in an associate degree program, may also enter the School of Nursing for a BSN. A flexible program of study is designed for RN's that offers opportunity for part-time study or online study in a time frame that allows for continued employment. After successful completion of 12 hours of Upper Division nursing course work (NURS 3281 OR NURS 3260 & 3261, NURS 3380, NURS 3430, NURS 3465) RN to BSN (designated as NURN) students will be awarded 32 semester hours of credit (NURS 3250, NURS 3270, NURS 3271, NURS 3280, NURS 3350, NURS 3361, NURS 3370, NURS 3371, NURS 4000, NURS 4001, NURS 4100, NURS 4101).

All Upper Division Nursing students are required to complete and submit the Student Health Form that shows proof of certain immunizations required for clinical practice. Because the School of Nursing seeks to provide a reasonably safe environment for its nursing students and their patients, a student may be required during the course of the program to demonstrate physical and/or emotional fitness to meet the essential requirements of the program. Such essential requirements may include freedom from communicable diseases, the ability to perform certain physical tasks, and suitable emotional fitness. Any appraisal measures used to determine such physical and/or emotional fitness would be in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Upper Division Nursing students are required to purchase liability insurance and will be assessed fees for achievement tests. The School of Nursing supports and enforces the TTU drug free campus/work place policy. Criminal background checks are a requirement for training at most affiliated clinical nursing sites. Additional screening, such as drug screening, may be a requirement for training at some affiliated clinical nursing sites. Based on the results of these checks, an affiliated clinical site may determine not to allow a student's presence at their facility. This could result in the students' inability to complete the program. The THA.com

website has links available for requesting this check, a list of available vendors can be provided on request or the student may choose or be required to use the vendor designated by a clinical site to be allowed to train at that site.

Department	Curriculum	Degree
Nursing	Nursing	B.S.N.

Individual curricula begin on Catalog page 100.

Course descriptions begin on Catalog page 189.

ANGELO AND JENNETTE VOLPE LIBRARY

LEARNING SUPPORT PROGRAM

Janet F. Whiteaker, Coordinator; Associate Professor Bryant; Assistant Professors Harden, Whiteaker; Instructors Duvier, Lewald

The Learning Support Program provides academic assistance in the form of tutoring, workshops, computerized exercises, individual conferences, etc. Participation in these activities may be required by the University concurrent to enrollment in college-level classes.

Based upon ACT/SAT scores and test scores from the ACCUPLACER/COMPASS/ASSET, students may be required to participate in one or more areas of Learning Support.

Students whose Best ACT-English subject scores are less than 18 and/or whose ACCUPLACER Placement Writing Exam Scores are less than 93 are required to participate in ENGL 1010 Writing I and READ 1100 Learning Support Lab for Writing I.

Students whose Best ACT-Reading subject scores are less than 19 and/or whose ACCUPLACER Placement Reading Exam Scores are less than 86 are required to take READ 1010 College Reading Improvement [Lecture and Lab]. Students with a reading requirement should not enroll in courses that have an excessive amount of reading, such as history, psychology, sociology, philosophy, government, political science, etc. Students whose ACT-Reading subject scores are 17 and 18

may choose one (1) of the high-reading-content courses listed above to take concurrently with READ 1010.

Students whose Best ACT-Math subject scores are less than 19 and whose majors require algebra-based mathematics are required to take MATH 1000 [see Math Department]. Students with ACT-Math subject scores less than 17 should take the "L" section of MATH1000. Students with MATH 1000 requirements may not enroll in college-level math, chemistry, or physics until the MATH 1000 requirement has been satisfactorily completed. Students whose majors do not require algebra-based mathematics but whose Best ACT-Math subject scores are less than 19 should enroll in "L" sections of MATH 1010 or MATH 1530.

Learning Support attendance is mandatory. A grade of "C" or higher in the college-level class is required for progression to the next level.

All students who are required to participate in two or more courses with required Learning Support are also required to take UNIV 1030 - Learning Strategies.

INDEPENDENT PROGRAMS

COOPERATIVE EDUCATION

Ashley Kabakci, Associate Director

The Cooperative Education Program (Co-op) is a voluntary, independent educational program coordinated through the **Office of Career Development**, located on the third floor of the Roaden University Center. The program integrates formal classroom study with off-campus work experience. There are four co-op study/work plans: **Plan A** (alternating one-year cycles), **Plan B** (alternating semesters), or **Plan C** (simultaneous work and study assignment), and **Plan D** (multiple summers).

Co-op work assignments are available in industry and business, agricultural areas, educational systems, and governmental agencies. Students applying for Co-op are not guaranteed work assignments nor stipulated specific job benefits or salaries. Employers determine the salaries and pay students directly. In regard to permanent employment after graduation, participation in the Co-op Program involves no obligation on the part of the university, student, or employer. Co-op experience is a benefit to students in securing full-time employment following graduation. Many students do return to their co-op employers after graduation.

Co-op students are required to complete the same academic program for graduation as non-co-op students. Students must register and pay a fee for a one hour Co-op course each semester of their work assignment. Co-op students are classified as **full-time** by the university.

Students on assignment must submit a work report by an established date and will receive a grade of **Satisfactory or Unsatisfactory** (S or U). Students must maintain a 2.0 QPA.

Additional information about the Cooperative Education Program may be obtained by contacting the Office of Career Development.

HONORS PROGRAM

Dr. Rita Barnes, Director

The Honors Program provides challenging learning opportunities for academically gifted students, motivating them to achieve their full academic and career potential. Enrollment in Honors classes is limited. Emphasis is placed on individual initiative and development, leadership and teamwork, critical thinking and communication skills.

HONORS SECTIONS

Honors sections are available in a number of regularly offered courses required of freshmen and sophomores. These sections are available to Honors Program students on a permit-only basis. Honors sections provide more intensive discussion, presentations, and greater opportunities for individual performance.

Full members of the Honors Program are given priority in registering for all Honors courses. Under special circumstances an Honors student may take a regular section as an Honors contract course.

The following Honors courses are available subject to scheduling:

Fall Semester

ENGR 1110, ENGR 1120
BIOL 1123
CHEM 1111
ECON 2010
ENGL 2130
ENGL 2235
ENGL 2330
HIST 2010
HON 1010
Honors 2000-level (Leadership and Personal Development)
HON 4013
HON 4023
MATH 1911
MUS 1030
PHIL 1030
PHYS 2112
SOC 1010
COMM 2025

Spring Semester

ENGR 1110, ENGR 1120
BIOL 2310
CHEM 1120
ECON 2020
ENGL 2130
ENGL 2235
ENGL 2330
HIST 2020
HON 4013
HON 4023
MATH 1921
MUS 1030
PHIL 1030
PHYS 2112
POLS 1030
COMM 2025

LEVELS OF PARTICIPATION

High school students with a composite ACT score of 26 or higher who have applied for admission to the University are invited to apply for full membership in the Honors Program. Transfer students with an ACT of 26 or higher and a college QPA of 3.5 may apply to transfer into the Honors Program. Out-of-state students with an ACT of 26 or higher or equivalent SAT score and a high school grade point average of 3.5 may be considered for the Honors Academic Scholarship, which waives out-of-state tuition fees in exchange for 60 hours of service. Students already enrolled at Tennessee Tech who have completed twelve semester hours of college course work with a cumulative quality point average of 3.5 or better may apply for full membership in the Honors Program. Students at all levels of membership must complete at least one Honors course per semester until completing the course requirements listed below ("Graduation Requirements") to maintain active membership eligibility.

Full Membership. All students must take HON 1010 during their first fall semester in Honors. To be accepted for full membership, a student must demonstrate the ability and willingness to meet the requirements for graduation *in cursu honorum*. At the end of the first semester in the Honors Program, a student must have at least a cumulative 3.1 average to maintain full membership. After the first semester, full members must maintain a cumulative 3.5 grade point average and take at least one honors course **each semester**. Full membership may be reinstated for students who have continued taking Honors courses when they regain a 3.5 cumulative QPA.

Associate Membership. A member whose QPA falls between 3.1 and 3.5 after the first semester continues participation as an associate member, taking Honors courses and participating in the Associated Scholars Guild.

Affiliate Membership. Any student who is not a full or associate member but is continuing to fulfill Honors course requirements is an affiliate member. In general, an incoming freshman must have a composite ACT core of at least 26, and a previously enrolled student must have a cumulative QPA of at least 3.0 in order to enroll in an Honors course. However, exceptions may be made in individual cases, upon recommendation of the course instructor. Affiliate members may continue to be active in the Associated Scholars Guild.

Honors 2000-level personal development courses do not count toward this requirement.

GRADUATION REQUIREMENTS

A full member of the Honors Program may graduate *in cursu honorum* by completing the following requirements in addition to all relevant university, college, and departmental requirements:

1. Completion of Honors 1010.
2. Completion of at least 15 semester hours in Honors courses in at least three different disciplines (Honors sections or Honors Contracts by permit).
3. Completion of two Honors colloquia (HON 4013) or one colloquium and one directed studies (HON 4023) or Honors Thesis. Honors-level capstone, design, thesis, or research in the major may be substituted by pre-approval only.
4. A minimum cumulative quality point average of 3.5.
5. Completion of the Honors exit interview procedure.

A student graduating *in cursu honorum* will wear a gold stole and be given special recognition at the commencement ceremony and will have the notation "*in cursu honorum*" on the diploma and transcript.

PRE-LAW

Students desiring to go on to law school may complete the requirements for a degree in virtually any curriculum offered at the University. A college degree and a satisfactory score on the Law School Admission Test are generally required for admission to an approved law school. The following advisors can provide information regarding law school admission requirements and standards, and they can assist the student in planning a program for a career in law.

Advisor	Department/College
Ms. Edith Duvier	Arts and Sciences
Dr. Henry Mannle	Sociology and Political Science
Dr. Lori Maxwell	Sociology and Political Science
Dr. George Webb	History

DEPARTMENT OF MILITARY SCIENCE

U.S. Army Reserve Officers' Training Corps

LTC Adam Grim, Chairperson
Professor of Military Science

OBJECTIVE

Tennessee Technological University hosts a Senior Division of the Army Reserve Officers' Training Corps (ROTC). The objective of this ROTC is to transform enrolled students into leaders of character that thrive in chaos to serve as Commissioned Officers in the Army Reserve, National Guard, and Active Army. The Lower Division curriculum provides the student with an appreciation of the responsibilities of each American toward National Defense. The Upper Division curriculum develops the world's premier leaders in the United States Army.

Institutional Requirements

Military Science is voluntary for all students. Students incur no military obligation by attending Lower Division Military Science classes during their freshman and/or sophomore years.

Senior ROTC Program

The General Military Science curriculum is in effect at this University. Classes in Military Science for the Upper and the Lower Division are offered during both Fall and Spring Semesters.

The Senior Division ROTC Program includes four years of college work and is divided into (1) Lower Division and (2) Upper Division.

1. The Lower Division (Misson Set (MS) I and MS II) comprises the first two years of college ROTC, and each semester consists of classroom instruction and leadership laboratory. Attendance at Cadet Initial Entry Training (CIET) for five weeks of summer training at Fort Knox may be required in order to start Upper Division. Some field training on weekends is required.
2. The Upper Division (MS III and MS IV) comprises the last two years of college ROTC, and each year consists of three hours per week including classroom instruction and leadership application. Additionally, Physical Training and Leadership Labs are conducted for a total of four hours per week. Attendance at Cadet Leader Course (CLC) of five weeks is required between the junior and senior years. Some field training on weekends is required. The Upper Division culminates in commissioning as a Second Lieutenant in the United States Army upon graduation from the University.

Requirements for Commissioning

In order to receive a commission as a Second Lieutenant, the student must satisfy the following requirements:

1. Successfully complete the Lower and Upper Division course requirements. Lower Division requirements can be satisfied by completing MS 1010, MS 1020, MS

2010, and MS 2020 or substituting previous military experience (See Paragraph: Credits For Previous ROTC Training or Active Military Service). The courses listed below constitute the Upper Division Advanced Course:

MS 3010	Fall Semester
MS 3020	Spring Semester
MS 3040 (Cadet Leaders Course)	Summer Semester
MS 4010	Fall Semester
MS 4020	Spring Semester

In addition to the classes listed above, students enrolled in the Upper Division must take MS 3000-01/MS 4000-01 (Physical Training) each semester.

2. Meet ROTC commissioning requirements, the Army's Height/Weight standards and pass the Army Physical Fitness Test.
3. In addition to the Lower and Upper Division Courses, the student must complete a military history course or two semesters of U.S. History. The student should confer with the Professor of Military Science to determine which course will satisfy this requirement.
4. Meet graduation requirements.

Scholarships and Financial Aid

The ROTC Program offers 4-year, 3-year, and 2-year scholarships to qualified students. Additionally, contracted students receive a monthly financial stipend of \$300-\$500 monthly. The Professor of Military Science offers a limited number of University dorm room scholarships for designated use. Advance course students and all scholarship students receive a monthly subsistence allowance during the school year. Students are also paid for the period of their attendance at the Cadet Initial Entry Training and the Cadet Leaders Course. National Army ROTC scholarship applications can be made at www.armyrotc.com.

Enrollment Requirements

The general requirements for enrollment and continuance in ROTC are: (a) citizen of the United States, (b) physically and mentally qualified, (c) accepted by the university as a full-time student, (d) morally qualified, and (e) meet Army age requirements.

Enrollment in the Upper Division is not open to all students completing the Lower Division but only to those whose ROTC and academic records demonstrate that they will become quality Officers in the Army of the United States.

Students who transfer from colleges or universities without ROTC programs may attend a paid five-week Cadet Initial Entry Training (CIET) to meet the prerequisites of Upper Division. Any students who desire to participate in this program should contact the Military Science Department prior to the end of their first semester.

Disenrollment

Students may be disenrolled for failure to meet physical or academic standards, for disciplinary reasons, or for lack of Officer-like aptitudes. A student once formally enrolled in Upper Division may be discharged from the ROTC program in the event he/she is placed on academic probation by institutional authorities as the result of substandard academic grades.

Credits for Previous ROTC Training or Active Military Science

College credit is allowed for ROTC training successfully completed at other institutions.

Students who have completed Basic Training with any military service of the United States, to include Reserves and National Guard, may receive credit for Military Science courses, as jointly determined by the President of the University and the Professor of Military Science. Credit given will not exceed 8 hours of Basic Course credit. A student requesting credit for prior ROTC training or Active Military Service must obtain a certificate from the Professor of Military Science.

Minor in Military Science

A minor in Military Science is available to those students enrolled in and successfully completing six credit hours of Upper Division and a total of 15 elective credit hours of ROTC, Upper or Lower Division.

ROTC Special Activities

The Military Science department has clubs to promote special activities related to ROTC that include the Scabbard and Blade Society, Tech Rangers, Color Guard, Officer Christian Fellowship and Society of American Military Engineers.

AIR FORCE RESERVE OFFICERS TRAINING CORPS (AFROTC)

Currently there is no charge for tuition to take Air Force ROTC. The grade and credit can transfer back for graduation.

The Air Force Reserve Officer Training Corps (AFROTC) provides pre-commission training for college men and women who desire to serve as commissioned officers in the United States Air Force. When combined with the academic disciplines offered at the college level, the program provides the student a broad-based knowledge of management, leadership, and technical skills required for a commission and subsequent active-duty service in the Air Force. Graduates are commissioned as Second Lieutenants and will enter active duty. The main objectives of producing officers through the AFROTC program are (1) to procure officers with a broad educational base; (2) to provide a basic military education for college students; (3) to teach fundamentals and techniques of leadership, management, and decision making; and (4) to develop, in conjunction with other academic disciplines, individual character and attributes required of a commissioned officer in the United States Air Force.

AFROTC Program/Scholarships**Enrolling in AFROTC**

For application deadlines go to www.tnstate.edu/afrotc. Students may participate in the Air Force ROTC program in cooperation with Tennessee State University. Call Detachment 790, (615) 963-5980, and ask for a Cross-Town Application. The program provides training and education that will develop skills and attitudes vital to the professional Air Force officer. In this program students are eligible to compete for scholarships (2.5+ GPA) that cover the cost of tuition and textbooks, and provide scholarship cadets with a monthly stipend.

Curriculum

The General Military Course (GMC) is 1 credit hour and is composed of the first four semesters of aerospace studies and is for freshmen and sophomores. The Professional Officer Course (POC) is 3 credit hours and constitutes the final four semesters of AFROTC study for juniors and seniors. The Leadership Lab is also 1 credit hour. Students who participate in Air Force ROTC are jointly enrolled as a TSU student and participate in Aerospace Studies (Air Force ROTC) at TSU. For more information, contact the unit admissions officer at (615) 963-5931/5979 or check our website at www.tnstate.edu/afrotc.

General Benefits

All students enrolled in the AFROTC program are provided textbooks and uniforms at no expense. Professional Officer Course (POC) students (juniors and seniors) and all scholarship students receive a monthly subsistence allowance of up to \$500 tax-free.

Sponsored Activities

Arnold Air Society is a national society of AFROTC cadets who excel in character and academics and exhibit interest in the study of aerospace technology. The group meets at TSU.

Professional Development Training is provided during the summers to cadets interested in enhancing their knowledge of Air Force leadership and management opportunities, increasing their cultural awareness, and learning about specific career specialties.

AFROTC Flight Orientation Program is designed to allow all cadets, regardless of intended career field, the chance to fly in Civil Air Patrol aircraft. Everyone can experience the joy of flight.

Aerospace Studies Courses

Freshman Year: AS 100 - The Foundations of the United States Air Force is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force.

Sophomore Year: AS 200 - The Evolution of USAF Air and Space Power features topics on Air Force heritage and leaders; introduction to air power through examination of the Air Force Core Functions; and continued application of communication

skills. Its purpose is to instill an appreciation of the development and employment of air power and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate.

Junior Year: AS 300 - The United States Air Force Leadership Studies teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors.

Senior Year: AS 400 - National Security Affairs/Preparation for Active Duty is designed for college seniors and gives them the foundation to understand their roles as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level.

Curricula

ACCOUNTING (ACCT)**(Leading to the Bachelor of Science in Business Administration Degree)**

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
ACCT 3170 Financial Accounting & Reporting I	3
ACCT 3180 Financial Accounting & Reporting II.....	3
ACCT 3210 Cost Accounting.....	3
ACCT 3330 Federal Taxation I.....	3
ACCT 3620 Auditing I.....	3
ECON 3610 Business Statistics I	3
BMGT 3510 Management & Organization Behavior ..	3
DS 3520 Operations Management	3
DS 3840 Management Information Systems	3
Communication Elective ¹	3
Total	30

Senior Year	sem. hrs.
ACCT elective ²	3
BMGT 3720 Business Communication I.....	3
MKT 3400 Principles of Marketing.....	3
ECON 3320, 3810, or 3820	3
FIN 3210 Principles of Managerial Finance.....	3
LAW 2810 Business Legal Environment and Ethics...	3
DS 3620 Business Analytics: Data Driven Decision Making.....	3
BMGT 4930 Business Strategy	3
Business elective ³	3
Elective ³	3
Total	30

¹ COMM 2025 or PC 2500 if not taken as part of the General Education Core Communication requirement, ENGL 3250, 4970; MET 4010; COMM 3130, 3630, 4430, 4620, 4630; FREN/GERM/SPAN 1010 or 1020.

² Accounting electives, select two courses:

ACCT 4230	Advanced Managerial Accounting
ACCT 4340	Tax Management for Entities
ACCT 4410	Financial Accounting and Reporting III
ACCT 4530	Governmental and Not-For-Profit Accounting
ACCT 4600	Forensic Accounting and Fraud Auditing
ACCT 4700	International Experiences in Accounting
ACCT 4750	Auditing In An EDP Environment
ACCT 4800	Internship in Accounting

³ Elective courses are to be selected in consultation with the academic advisor. Accounting majors are required to complete a total of 11 elective hours and six communication elective hours for graduation. Departmentally-approved communication courses and electives are to be selected in consultation with the academic advisor and will be completed during the freshman, sophomore, junior and senior years.

AGRICULTURE (AGRI)**AGRIBUSINESS MANAGEMENT CONCENTRATION (AGBE)****(Leading to the Bachelor of Science in Agriculture Degree)**

Agribusiness Management provides training in economics and business management principles related to production, distribution, and consumption of agricultural goods and services. Graduates enter careers in government agencies, commodity trading, communications, public relations, finance, marketing, sales and agribusiness management.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
AGRN 1100 Plant Science	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Humanities/Fine Arts Elective ²	3
MATH 1130, 1530, 1630, 1830 or 1910	3-4
Natural Science.....	8
DS 2810 Computer Applications in Business	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	30-31

Sophomore Year	sem. hrs.
AGBE 2100 Economics of Agriculture.....	3
AGET 2110, 2115 or 3110, 3115	3
AGRN 2300 Soils	3
COMM 2025 or PC 2500.....	3
ECON 2010 Principles of Microeconomics	3
ECON 2020 Principles of Macroeconomics	3
ACCT 2110 Principles of Accounting I	3
ACCT 2120 Principles of Accounting II	3
ENGL 2130, 2235, or 2330	3
Humanities/Fine Arts Elective ²	3
Total	30

Junior Year	sem. hrs.
AGBE 3110 Agricultural Marketing & Futures	3
AGBE 3400 Agricultural Finance.....	3
AGBE 3950 Agribusiness Internship	3
AGBE 4030 Agribusiness Management.....	3
BMGT 3510 Management and Organization Behavior.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MKT 3400 Principles of Marketing	3
Upper Division Agriculture Electives ¹	3
Elective	3
Total	30

Senior Year	sem. hrs.
AGBE 4120 Natural Resource Economics	3
AGBE 4130 Agricultural Policy	3
AGBE 4210 Agricultural & Biological Statistics.....	3
LAW 2810 Business Legal Environment and Ethics	3
Upper Division Business or Economics Electives.....	6
Upper Division Agriculture Elective ¹	6
Electives	3-4
Total	29-30

(Note: A student would be able to qualify for consideration into the MBA program at Tennessee Tech by completing the following courses as Business/Economics electives: MKT 3400, BMGT 3510, FIN 3210, DS 3620, LAW 2810, MKT 3400 and ECON 3610.)

¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

² From University approved list.

AGRICULTURAL COMMUNICATIONS CONCENTRATION (AGCM)

(Leading to the Bachelor of Science in Agriculture Degree)

Agricultural Communications Concentration prepares students for careers in agricultural communications and related fields. This curriculum provides an opportunity for students to combine technical agriculture with Agricultural Education, Journalism, Professional Communications, and Business Communications. Possible career areas include: agricultural information agencies; newspaper writing and editing; magazine feature writing and editing; agricultural related publications; public relations; advertising and sales; environmental reporting; and Agricultural Extension.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
AGRN 1100 Plant Science	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
BIOL 1123 or 2310	4
MATH 1130 College Algebra.....	3
MATH 1630 Finite Mathematics	3
CHEM 1010 Introductory Chemistry I.....	4
CHEM 1020 Introductory Chemistry II.....	4
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	31

Sophomore Year	sem. hrs.
AGCM 2010 Introduction to Agricultural Communications	3
AGRN 2300 Soils	3
JOUR 2200 Mass Communication in a Changing Society	3
JOUR 2220 News Reporting & Copy Editing.....	3
ECON 2010 Principles of Microeconomics.....	3
ENGL 2130, 2235, or 2330.....	3
DS 2810 Computer Applications in Business	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3

COMM 2025 or PC 2500.....	3
Elective	1
Total	31

Junior Year	sem. hrs.
AGBE 2100 Economics of Agriculture.....	3
AGET 2110, 2115 or 3110, 3115	3
AGED 3010 Professional Leadership Development...	3
Upper Division Ag Elective ¹	3
BMGT 3720 Business Communication I	3
ECON 2020, PSY 1030, or SOC 1010.....	3
PC 3500 Rhetoric and the Internet.....	3
Humanities and/or Fine Arts Electives ²	6
Elective	3
Total	30

Senior Year	sem. hrs.
AGCM 3010 Theory and Practice of Agricultural Publishing	3
AGCM 4850 Internship in Agricultural Communications	4
AGCM 4860 Internship in Agricultural Communications	4
AGCM 4890 Agricultural Publication Production	3
AGED 4150 Communications & Public Relations in Agricultural & Extension Education	3
Upper Division Ag Electives ¹	9
Electives.....	4
Total	30

¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

² Select from the University approved list.

AGRICULTURAL EDUCATION CONCENTRATION (AGED)

(Leading to the Bachelor of Science in Agriculture Degree)

Agricultural Education prepares students for careers as high school agricultural education instructors, Agricultural Extension agents, and other related fields. Students learn to evaluate community needs and how to implement an educational program.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab	1
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
BIOL 1123 or 2310.....	4
MATH 1130 College Algebra	3
MATH 1530 Introductory Statistics.....	3
CHEM 1010 Introductory Chemistry I.....	4
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	29

Sophomore Year	sem. hrs.
AGBE 2100 Economics of Agriculture.....	3
AGET 2110, 2115 or 3110, 3115.....	3
AGED 2120 Introduction to Agricultural and Extension Education	3
AGBE 2010; ECON 2010, 2020; PSY 1030; or SOC 1010	6
ENGL 2130, 2235, or 2330.....	3
EDPY 2210 Educational Psychology.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
COMM 2025 or PC 2500.....	3
Total	30

Junior Year	sem. hrs.
AGRN 2300 Soils	3
ANS 3130 Animal Breeding.....	3
AGHT 3410 Plant Propagation	3
AGHT 4410 or 4420	3
AGED 4110 Methods of Teaching Agriscience	3
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
Humanities/Fine Arts Electives ¹	6
Elective.....	1
Total	28

Senior Year	sem. hrs.
AGED 4200 Methods and Techniques of Teaching in Agricultural and Extension Education.....	3
AGED 4300 Development of Young Programs in Agricultural and Extension Education.....	3
Upper-division Agriculture Elective ²	3
AGED 4871 Residency I.....	5
AGED 4872 Professional Seminar I	5
AGED 4881 Residency II.....	10
AGED 4882 Professional Seminar II	2
Total	31

¹ Select from the University approved list.

² No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

AGRICULTURAL ENGINEERING TECHNOLOGY CONCENTRATION (AGET)

(Leading to the Bachelor of Science in Agriculture Degree)

Agricultural Engineering Technology provides basic training in engineering and agriculture. Students are prepared to solve problems related to agricultural production and processing systems and the management and conservation of agricultural land and water resources. Graduates pursue careers in food and fiber handling and processing facilities, farm machinery sales and service, management of large mechanized farms, and other sectors of Agricultural Engineering Technology.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab.....	1
AGRN 1100 Plant Science	3

AGRN 1110 Plant Science Lab.....	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
CHEM 1010, 1020 or 1110, 1120.....	8
MATH 1130, 1530, 1630, 1730, 1830, or 1910 (Select two)	6-7
DS 2810 Computer Applications in Business.....	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	32-33

Sophomore Year	sem. hrs.
AGET 2110 Agriculture Engineering Technology.....	2
AGET 2115 Agriculture Engineering Technology Laboratory.....	1
AGBE 2100 Economics of Agriculture.....	3
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties.....	1
BIOL 1010, 1020, 1123, 2310, PHYS 2010 or 2020 (Select two)	8
ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500.....	3
Social/Behavioral Science Electives ¹	6
MET 2000 Occupational Safety	2
Total	32

Junior Year	sem. hrs.
ACCT 3720 Survey of Accounting.....	3
AGET 3110 Natural Resource Systems.....	2
AGET 3115 Natural Resources Systems Laboratory .	1
AGET 3320 Small Power Equipment	2
AGET 3325 Small Power Equipment Laboratory	1
AGET 3620 Computer-Aided Design in Agriculture.....	3
Upper-division Agriculture Electives ²	6
Humanities/Fine Arts Electives ³	6
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Total	30

Senior Year	sem. hrs.
AGBE 3110 Agricultural Marketing and Futures.....	3
AGET 4220 Agricultural Machinery & Tractors	2
AGET 4225 Agricultural Machinery & Tractors Lab....	1
AGET 4720 Agricultural Processing.....	3
AGET 4610 Greenhouse Structures & Landscaping Equipment	3
Upper-division Agriculture Elective ⁴	3
AGET 3510, 3560, 3565, 4620, 4940, 4950, 4960, 4970, 4980; AGR 3940, 3950, 3960, 4920	3
BMGT 3510 Management & Organization Behavior ..	3
Total	24-27

¹ Select two from the University approved social/behavioral science list.

² Select course from any agriculture discipline.

³ Select two courses from the University approved Fine Arts list.

⁴ Select course from any Agriculture discipline.

AGRICULTURAL SCIENCE AND MANAGEMENT (AGMG)

(Leading to the Bachelor of Science in Agriculture Degree)

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab.....	1
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Humanities/Fine Arts Electives.....	3
MATH 1130, 1530, 1630, or 1830	3
Natural Science	8
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	29

Sophomore Year	sem. hrs.
AGBE 2100 Economics of Agriculture	3
AGET 2110, 2115 or 3110, 3115.....	3
AGRN 2300 Soils	3
COMM 2025 or PC 2500	3
ENGL 2130, 2235, or 2330.....	3
Social/Behavioral Science Elective ²	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Electives.....	3
Total	30

Junior Year	sem. hrs.
AGHE 3000 or AGED 3010	3
AGR 3940, 3950 or 3960.....	3
AGRN 3610, 3620 or 3630	3
Primary Ag concentration	6
HEC 3011 Consumer Economics.....	3
HEC 1030, HEC 2020 or ESS 3000	2-3
PSY 3000 Problem Solving	3
Select nine hours from the directed social science electives: AGBE 4120, AGBE 3110 or MKT 3400; PSY 3000; AGRN 3610, 3620, 3630; HEC 1030, HEC 2020 or ESS 3000.....	9
Select nine hours from the directed science electives: BIOL 1123, 2310, 3130, 3330; CHEM 3010, 3005; GEOL 3010 or ESS 3710	9
Total	33

Senior Year	sem. hrs.
AGBE 4120, AGBE 3110 or MET 3400	3
Primary Ag concentration (4000 level)	9
AGR 4930 Senior Seminar in Ag.....	2
4950, 4960, 4970 Ag Topics (1 hour if taking AGRN 2310).....	2
Agriculture electives (18 hours upper division).....	24
Total	28

AGRITOURISM CONCENTRATION (ATOU)

(Leading to the Bachelor of Science in Agriculture Degree)

Agritourism provides a cutting edge option for students looking to enter the agricultural industry or return to a home operation and increase the viability of maintaining their cultural heritage. Graduates enter careers as Agritourism enterprise managers, entrepreneurs in their own enterprise, non-formal educators serving as developers of educational activities and programs for Agritourism sites. In addition, some of our students will seek entrance into graduate school to open even more doors through Cooperative Extension and the USDA.

Freshman Year	sem. hrs.
AGRN 1100 Plant Science.....	3
ANS 1200 Introductory Animal Science	3
CHEM 1010 Introductory Chemistry I.....	4
CHEM 1020 Introductory Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1130, 1530, 1630, 1830, or 1910.....	6-7
SOC 1010 Introduction to Sociology	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	30-31

Sophomore Year	sem. hrs.
ACCT 3720 Survey of Accounting.....	3
AGBE 2100 Economics of Agriculture.....	3
AGET 2110, 2115 or 3110, 3115	3
ATOU 2100 Agritourism Development and Promotion.....	3
DS 2810 Computer Applications in Business.....	3
ECON 2010 Principles of Microeconomics	3
ENGL 2130, 2230 or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MET 2000 Occupational Safety	2
COMM 2025 or PC 2500.....	3
Total	32

Junior Year	sem. hrs.
AGRN 2300 Soils	3
AGRN 3610 Food Safety in Agritourism Planning.....	3
ATOU 3020 Agriculture and Heritage Based Tourism.....	3
Humanities/Fine Arts Electives.....	6
Directed Ag Electives	12
Elective	1
Total	30

Senior Year	sem. hrs.
AGR 3950 Advanced Internship.....	3
ATOU 4100 Direct Marketing for Agriculture and Human Ecology.....	3
ATOU 4200 Sustainable Tourism as Economic and Community Development.....	3
BMGT 3510 Management and Organization Behavior.....	3
LAW 2810 Business Legal Environment and Ethics	3
MKT 3400 Principles of Marketing	3

MKT 3900 Entrepreneurship/Small Business.....	3
MKT 4530 Consumer Behavior	3
Electives.....	<u>3-4</u>
Total	26-27

AGRONOMY AND SOILS CONCENTRATION (AGRN)

(Leading to the Bachelor of Science in Agriculture Degree)

Agronomy and Soils students study the complex processes of plants and composition of soil in which they grow. Areas of interest are crop science and soil science. Graduates pursue careers as agronomists; Extension agents; Natural Resources Conservation Service employees; and herbicide, fertilizer, and seed industry research and development specialists and sales representatives.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab.....	1
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
MATH (Any two) 1130, 1530, 1630, 1830, or 1910	6-7
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1010, 1020 or 1110, 1120	8
DS 2810 Computer Applications in Business	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	<u>1</u>
Total	32-33

Sophomore Year	sem. hrs.
AGBE 2100 Economics of Agriculture	3
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties	1
AGRN 3230 or 4230.....	4-3
AGRN 3100 Turfgrass Management	3
ENGL 2130, 2235, or 2330.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
AGET 2110, 2115 or 3110, 3115.....	3
BIOL 2310 General Botany	4
Social/Behavioral Science Elective ²	<u>3</u>
Total	32-33

Junior Year	sem. hrs.
AGRN 3020 Crops in Sustainable Systems	3
AGHT 3030 Integrated Pest Management	3
CHEM 3005 or ESS 3710.....	4
COMM 2025 or PC 2500	3
BIOL 3200 or 3330	4-3
Humanities/Fine Arts Elective ³	3
Upper-division Agriculture Elective ¹	3
AGRN 4130 Forage Crops Production & Management	3
Social/Behavioral Science Elective ³	<u>3</u>
Total	28-30

Senior Year	sem. hrs.
AGRN 4100 Weed Science.....	3
AGRN 4210 Soil Fertility & Fertilizers	3
AGRN 4120, ANS 3130, or BIOL 3810	3-4
Upper-division Agriculture Electives ¹	6
Humanities/Fine Arts Elective ³	3
Electives.....	<u>5-10</u>
Total	24-30

¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

² Select two from University approved list.

³ Select two from University approved list.

ANIMAL AND PRE-VETERINARY SCIENCE CONCENTRATION

Option I: Animal Science (ANSC)

(Leading to the Bachelor of Science in Agriculture Degree)

Animal Science deals with all phases of the livestock and dairy industry. Areas emphasized are nutrition, physiology, genetics, management technology, quality control and environmental regulations. Graduates enter careers in farm management, Extension Service, food quality control, governmental health agencies, farm credit institutions, and agricultural sales and management.

Freshman Year	sem. hrs.
AGBE 2100 Economics of Agriculture	3
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab	1
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
MATH 1130, 1530, 1630, or 1830 ¹	3
BIOL 1123 General Zoology	4
DS 2810 Computer Applications in Business	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ANS 2020 Livestock Management	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	<u>1</u>
Total	31

Sophomore Year	sem. hrs.
AGET 2110, 2115 or 3110, 3115	3
ENGL 2130, 2235 or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1130, 1530, 1630, or 1830 ¹	3
ANS 2110 Livestock Evaluation	3
CHEM 1010, 1020, or 1110, 1120.....	8
COMM 2025 or PC 2500	3
Electives.....	<u>4</u>
Total	33

Junior Year	sem. hrs.
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties.....	1
ANS 3010 Animal Nutrition	3
ANS 3020 Feeds & Feeding	3

ANS 3130 Animal Breeding.....	3
ANS 3140 Reproduction in Farm Animals.....	3
ANS 3150 Common Diseases & Parasites of Domestic Animals.....	3
CHEM 3005 Elementary Organic Chemistry	4
Upper-division Agriculture Elective ²	3
Social/Behavioral Science Elective ³	3
Humanities/Fine Arts Elective ³	3
Total	32

Senior Year	sem. hrs.
AGRN 4110 Forage Crops Production & Management	3
ANS 3310 Meat, Dairy and Poultry Products.....	3
Social/Behavioral Science Elective ³	3
4000-Level ANS Production Courses.....	6
BIOL 3200 or 3230	4
Humanities/Fine Arts Elective ³	3
Total	25

- ¹ Select two math courses from the above list.
- ² Select course from any Agriculture discipline.
- ³ Select two courses from the University approved social/behavioral science list and two courses from the University approved humanities and/or fine arts list.

ANIMAL AND PRE-VETERINARY SCIENCE CONCENTRATION

Option II: Pre-Veterinary Science (ANS2)

(Leading to the Bachelor of Science in Agriculture Degree)

The Pre-Veterinary Science curriculum is designed to enable a student to enter a College of Veterinary Medicine.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab.....	1
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
MATH 1130, 1530, 1630, or 1830 ¹	3
BIOL 1123 Biology II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ANS 2020 Livestock Management	3
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	33

Sophomore Year	sem. hrs.
AGET 2110, 2115 or 3110, 3115	3
ENGL 2130, 2235, or 2330	3
MATH 1130, 1530, 1630, or 1830 ¹	3
BIOL 3140 Cellular Biology	4
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
COMM 2025 or PC 2500.....	3
AGBE 2100 Economics of Agriculture.....	3
BIOL 2310 General Botany	4
Total	31

Junior Year	sem. hrs.
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties.....	1
ANS 3010 Animal Nutrition	3
ANS 3130 Animal Breeding	3
ANS 3140 Reproduction in Farm Animals.....	3
ANS 3150 Common Diseases & Parasites of Domestic Animals	3
PHYS 2010 Algebra-based Physics I.....	4
PHYS 2020 Algebra-based Physics II	4
Social/Behavioral Science Elective ²	3
Humanities/Fine Arts Elective ²	3
Total	30

Senior Year	sem. hrs.
ANS 3330 Anatomy and Physiology of Livestock Animals	3
CHEM 4610 General Biochemistry I	3
CHEM 4620 General Biochemistry II	3
Social/Behavioral Science Elective ²	3
4000-Level ANS production course.....	3
Humanities/Fine Arts Elective ²	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Total	26

- ¹ Select two math courses from the above list.
- ² Select two courses from the University approved social/behavioral science list and two courses from the University approved humanities and/or fine arts list.

ENVIRONMENTAL AGRISCIENCE CONCENTRATION (AGES)

(Leading to the Bachelor of Science in Agriculture Degree)

Environmental Agriscience is an environmentally oriented curriculum that offers courses in soils, geology, ecology, hydrology, and biology in an environmental context in addition to traditional agriculture courses. Graduates in the Environmental Agriscience concentration could work in fields such as water quality, reclamation, and developing environmental impact statements. Environmental consulting firms, the EPA, state health departments, the Natural Resources Conservation Service, and the Agricultural Extension Service are a few examples of possible employers.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab	1

AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
MATH 1130, 1530, 1630, 1830, or 1910 (Select Two)	6-7
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1010, 1020 or 1110, 1120	8
DS 2810 Computer Applications in Business	3
AGHE 1020 Connections in Agriculture and Human Ecology	1
Total	32-33

Sophomore Year	sem. hrs.
AGBE 2100 Economics of Agriculture	3
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
AGET 2110, 2115 or 3110, 3115	3
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties	1
BIOL 2310 General Botany	4
GEOL 1040 Physical Geology	4
GEOL 1045 Earth Environment, Resources & Society	4
Total	31

Junior Year	sem. hrs.
AGRN 3230 Environmental Soil Science	4
AGRN 4220 Environmental Soil Chemistry	3
BIOL 3130 or PHYS 2010	4
COMM 2025 or PC 2500	3
AGRN 4210, BIOL 4840, or GEOL 4150 (select two)	6-7
Humanities/Fine Arts Elective ²	3
Upper-division Agriculture Elective ¹	3
Social/Behavioral Science Elective	3
Total	29-30

Senior Year	sem. hrs.
AGRN 4100, GEOL 3230, or BIOL 3200	3-4
AGRN 4230 Soil Classification	3
Social/Behavioral Science Elective ³	3
Upper-division Agriculture Electives ¹	6
Humanities/Fine Arts Elective ²	3
Electives	6-9
Total	26-30

¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

² Select two from the University approved list.

³ Select two from the University approved list.

HORTICULTURE CONCENTRATION (HORT)

(Leading to the Bachelor of Science in Agriculture Degree)

Horticulture combines training in the biological and physical sciences with sound plant cultural practices. Training is offered in plant identification, production and handling of greenhouse and nursery crops, and landscape design and management. Graduates enter careers in management, production, processing, sales, education, and governmental agencies related to the green industries.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1010, 1020 or 1110, 1120	8
MATH 1130, 1530, 1630, 1830, or 1910	6-7
DS 2810 Computer Applications in Business	3
AGHE 1020 Connections in Agriculture and Human Ecology	1
Total	31-32

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500	3
Social/Behavioral Science Electives ²	6
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
AGBE 2100 Economics of Agriculture	3
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties	1
BIOL 2310 General Botany	4
Total	29

Junior Year	sem. hrs.
AGET 3110 Natural Resource Systems	2
AGET 3115 Natural Resources Systems Lab	1
AGHT 3030 Integrated Pest Management	3
AGHT 3400 Landscape Horticulture	3
AGHT 3410 Plant Propagation	3
AGHT 3450 Dendrology	3
AGHT 3470 Landscape Plant Materials	3
Humanities/Fine Arts Elective ³	3
BIOL 3200, 3330, 3810, 4250, 4310, or 4320	3-4
Upper-division Agriculture Elective ¹	3
AGHT elective (may use 1 AGR 3940/50/60 internship)	3
Total	30-31

Senior Year	sem. hrs.
AGHT 4410 Nursery Management	3
AGHT 4420 Greenhouse Management & Crop Production	3
AGHT elective	3
AGRN 4210 Soil Fertility & Fertilizers	3
AGET 4610 Greenhouse Structures & Landscaping Equipment	3
Upper-division Agriculture Electives ¹	6
Humanities/Fine Arts Elective ³	3
Electives	2-4
Total	28-30

¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

² Select two from University approved list.

³ Select two from University approved list.

**NURSERY AND LANDSCAPE MANAGEMENT
CONCENTRATION (NLMT)****(Leading to the Bachelor of Science in Agriculture Degree)**

Nursery and Landscape Management provides students an opportunity to combine agribusiness management training and horticulture training for managerial positions in the nursery and landscaping industries.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1010, 1020 or 1110, 1120	8
MATH 1130, 1530, 1630, 1830, or 1910 (Select Two)	6-7
DS 2810 Computer Applications in Business	3
AGHE 1020 Connections in Agriculture and Human Ecology	1
Total	31-32

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
AGBE 2100 Economics of Agriculture	3
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties	1
BIOL 2310 General Botany	4
ECON 2010 Principles of Microeconomics	3
ECON 2020 Principles of Macroeconomics	3
COMM 2025 or PC 2500	3
Elective	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Total	32

Junior Year	sem. hrs.
AGET 3110 Natural Resource Systems	2
AGET 3115 Natural Resource Systems Lab	1
AGHT 3400 Landscape Horticulture	3
AGHT 3410 Plant Propagation	3
AGHT 3450 or 3470	3
Humanities/Fine Arts Electives	6
ACCT 2110 Principles of Accounting I	3
ACCT 2120 Principles of Accounting II	3
AGBE 3110 Agricultural Marketing & Futures	3
AGBE 3400 Agricultural Finance	3
Total	30

Senior Year	sem. hrs.
AGBE 4030 Agribusiness Management	3
AGHT 4410 Nursery Management	3
AGRN 4210 Soil Fertility & Fertilizers	3
AGET 4610 Greenhouse Structures & Landscaping Equipment	3
Upper Division Directed Business Electives ²	6
Upper Division Agriculture Electives ¹	6
Elective	1-3
Total	27-29

- ¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)
- ² Choose two courses (six hours) from the following: BMGT 3510 or 3630, FIN 3210 or 3610, LAW 4720 or 2810, or MKT 3400, 3430 or 4500.

TURFGRASS MANAGEMENT CONCENTRATION (TMGT)**(Leading to the Bachelor of Science in Agriculture Degree)**

Turfgrass Management provides basic training in the science and culture of managing turfgrasses and the economics and business management principles related to the turf industry. Graduates are prepared to pursue careers in management of athletic turf, golf courses, municipal, industrial, home lawns, and other types of turf and related business.

Freshman Year	sem. hrs.
ANS 1200 Introductory Animal Science	3
ANS 1210 Introductory Animal Science Lab	1
AGRN 1100 Plant Science	3
AGRN 1110 Plant Science Lab	1
MATH 1130, 1530, 1630, 1730, 1830, or 1910 (Select two)	6-7
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1010, 1020 or 1110, 1120	8
BIOL 2310 General Botany	4
AGHE 1020 Connections in Agriculture and Human Ecology	1
Total	33-34

Sophomore Year	sem. hrs.
AGBE 2100 Economics of Agriculture	3
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
ECON 2010 Principles of Microeconomics	3
ECON 2020 Principles of Macroeconomics	3
ACCT 2110 Principles of Accounting I	3
ACCT 2120 Principles of Accounting II	3
AGET 2110, 2115 or 3110, 3115	3
DS 2810 Computer Applications in Business	3
Total	30

Junior Year	sem. hrs.
AGET 3320 Small Power Equipment	2
AGET 3325 Small Power Equipment Lab	1
AGRN 2300 Soils	3
AGRN 2310 Soil Chemical Properties	1
AGRN 3100 Turfgrass Management	3
AGHT 3470 Landscape Plant Materials	3
AGBE 3400 Agricultural Finance	3
COMM 2025 or PC 2500	3
Humanities/Fine Arts Elective ²	3
Upper Division Ag Electives ³	6
BIOL 3330 Entomology	3
Total	31

Senior Year	sem. hrs.
AGHT 3030 Integrated Pest Management	3
AGRN 4100 Weed Science	3
AGRN 4210 Soil Fertility & Fertilizers	3

AGBE 4030 Agribusiness Management	3
Humanities/Fine Arts Elective ²	3
Directed Business Electives ¹	6
Electives	3-4
Total	26-27

¹ Choose two courses (six hours) from the following: LAW 2810, BMGT 3510, BMGT 3630, MKT 3400, MKT 3430 or MKT 4500.

² Choose two from University approved list.

³ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

ART EDUCATION (ARED)

(Leading to the B.F.A. in Education Degree with endorsement, Grades K-12)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Natural Science Electives	8
Any General Education Math	3
ART 1045 Drawing I	3
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ARED 2020 Art Education Theory	2
Social/Behavioral Sciences Elective	3
FOED 1820 or 1822 or equivalent ¹	1
Total	31

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
PC 2500 or COMM 2025	3
ARED 1250 Digital Technologies in Art Education	3
ART 2040 Printmaking Relief	2
ART 2000 Art History Survey I	3
ART 2020 Art History Survey II	3
ART 1050 Drawing II	3
ART 2410 Painting I, Introduction	3
ART 2510, 2610, 2710, 2810, or 2910	3
ARED 3200 Art Applications	1
Social/Behavioral Sciences Elective	3
Studio emphasis (from Clay, Glass, Fibers, Metals, Painting or Wood) ²	3
Total	33

Junior Year	sem. hrs.
EDPY 2210 Educational Psychology	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
ARED 2050 STEAM Studio	2
ARED 3155 Elementary Practicum	1
ARED 3165 Secondary Practicum	1
ART 3130, 3150, 3160, 4100, or 4170	6
ART 3205 Methods and Media	2
Studio emphasis (from Clay, Glass, Fibers, Metals, Painting or Wood) ²	9
Total	31

Senior Year	sem. hrs.
ARED 4871 Residency I	5
ARED 4872 Professional Seminar	5
ARED 4881 Residency II	10
ARED 4882 Professional Seminar II	2
Studio emphasis (from Clay, Glass, Fibers, Metals, Painting or Wood) ²	3
Total	25

¹ This course not included in 120-hour curriculum.

² Studio Emphasis hours can be divided between two media.

³ Must submit evidence of current First Aid/CPR Training.

In the BFA concentration in art education only, the general education core requirement in humanities and/or fine arts is fulfilled by ART 2000 Art History I – 3 credits and ART 2020 Art History II – 3 credits, in combination with the approved literature course selected by the student for the total of the 9 credit hour requirement.

FINE ARTS (ART)

CLAY CONCENTRATION (BFAC)

(Leading to the Bachelor of Fine Arts Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Any General Education Math	3
Social/Behavioral Sciences Electives and/or Humanities/Fine Arts Electives	6
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ART 1045 Drawing I	3
ART 1050, 2320 or 2330	3
ART 2510 Introduction to Clay	3
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	30

Sophomore Year	sem. hrs.
ART 2410, 2610, 2710, 2810, or 2910 (Select one)	3
HIST 2010 Early United States History	3
ART 1250 Introduction to Digital Imaging	3
ART 2099 Professional Practices for the Artist	3
ART 2120 Art History II	3
ART 3130 Art Since 1900	3
ART 3510 Clay on Wheels	3
ART 3511 Intermediate Hand-building	3
Natural Science	8
Total	32

Junior Year	sem. hrs.
ART 3520 Advanced Clay Studio	3
ART 3521 Advanced Clay Studio	3
ART 3520, 3521, or 3530	3
ART Studio Electives ³	2
ART 2410, 2610, 2710, 2810, or 2910 (Select one)	3
ART 2000, 3150, 3160, 4040, 4100, or 4170 (Select two)	6
ENGL 2130, 2235, or 2330	3

HIST 2020 Modern United States History.....	3
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences Elective.....	3
Total	32

Senior Year sem. hrs.

Social/Behavioral Sciences Elective and/or Humanities/Fine Arts Elective	3
ART 3520 or 3521	3
ART 4510 Senior Thesis in Clay	12
ART Studio Electives or Guided Electives ³	8
Total	26

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentrations in Clay, Fibers, Glass, Metals, Painting and Wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

³ Art studio electives are defined as any art studio course not applied to other requirements. Allow up 6 credits of guided electives including courses outside the Art curriculum, such as WEBD 1500, MKT 3400, MKT 3900.

DESIGN CONCENTRATION (BFAD)

(Leading to the Bachelor of Fine Arts Degree)

Freshman Year sem. hrs.

ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ARED 1250 Digital Technologies in Art Education	3
ART 1340 Foundations Studio I	3
ART 2210 Introduction to Design	3
ART 2220 Typography, Text and Image	3
ART 1045 Drawing I	3
MATH	3
Social/Behavioral Sciences or Humanities/Fine Arts Electives	6
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	31

Sophomore Year sem. hrs.

ART 1350 Foundations Studio II	3
ART 2020 Art History Survey II	3
ART 1050 or 2340	3
ART 3130 Art Since 1900.....	3
ART 3210 Design Studio.....	3
ART 3220 Design Studio II	3
HIST 2010 Early United States History.....	3
COMM 2025 or PC 2500.....	3
Natural Science	8
Total	32

Junior Year sem. hrs.

ART 3230 Design Studio III.....	3
ART 3240 Illustration and Visual Narrative	3
HIST 2020 Modern United States History	3
ART 2410, 2510, 2610, 2710, 2810 or 2910	6
Art Studio Electives, WEBD 2300, JOUR 2200 or MKT 3400	3
Art Studio electives, WEBD 4950, JOUR 3740, MKT 3430, or MKT 3900.....	3
ART 3250, 3251 or 4240.....	3-4
ART 2000, 3150, 3160, 4040, 4100, or 4170	6
Total	30

Senior Year sem. hrs.

ENGL 2130, 2235, or 2330	3
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives	6
ART 3250 and/or 3251 or 4240.....	4
ART 4210 or 4220.....	8
ART 4230 Design Portfolio.....	4
Art Studio Electives, WEBD 4950, JOUR 3740, MKT 3430, or MKT 3900.....	6
Total	30

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentration in design must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

² Art studio electives and guided electives shall total 12 credit hours.

From 3 credits to 9 credits may be selected from art studio electives, defined as any art studio course not applied to other requirements.

From 3 credits to 9 credits may be selected from the following list of guided electives –COMM 1010, COMM 1020, COMM 3000, COM 3120, WEBD 1500, WEBD 2300, WEBD 4950, JOUR 2200, JOUR 3350, JOUR 3370, JOUR 3740, JOUR 4360, MKT 3200, MKT 3400, MKT 3430, MKT 3900

FIBERS CONCENTRATION (BFAF)

(Leading to the Bachelor of Fine Arts Degree)

Freshman Year sem. hrs.

ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Any General Education Math	3
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives	6
ART 1045 Drawing I.....	3
ART 1050, 2320 or 2330.....	3
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ART 2610 Introduction to Fibers	3
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	30

Sophomore Year sem. hrs.

HIST 2010 Early United States History	3
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Natural Sciences	8
ART 1250 Introduction to Digital Imaging	3
ART 2099 Professional Practices for the Artist.....	3
ART 2120 Art History Survey II	3
ART 2410, 2510, 2710, 2810, or 2910 (Select one)	3
ART 3130 Art Since 1900.....	3
ART 3610 Weaving I	3
ART 3620 Surface Design I.....	3
Total	32

Junior Year	sem. hrs.
ENGL 2130, 2235 or 2330.....	3
HIST 2020 Modern United States History.....	3
COMM 2025 or PC 2500.....	3
ART 2000, 3150, 3160, 4040, 4100, or 4170 (Select two)	6
ART 2410, 2510, 2710, 2810, or 2910 (Select one)	3
ART 3610, 3611, 3620 or 3621	3
ART 3630 or 4640	3
ART Studio Electives ³	2
ART 3611 Weaving II	3
ART 3621 Surface Design II.....	3
Total	32

Senior Year	sem. hrs.
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives.....	6
ART 4610 Senior Thesis in Fiber	12
ART Studio Electives and/or Guided Electives ³	8
Total	26

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentrations in Clay, Fibers, Glass, Metals, Painting, and Wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

³ Art studio electives are defined as any art studio course not applied to other requirements. Allow up to 6 credits of guided electives including courses outside the Art curriculum, such as WEBD 1500, MKT 3400, MKT 3900.

GLASS CONCENTRATION (BFAG)

(Leading to the Bachelor of Fine Arts Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Any General Education Math.....	3
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives.....	6
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ART 1045 Drawing I	3
ART 1050, 2320 or 2330	3
ART 2710 Introduction to Glass	3
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	30

Sophomore Year	sem. hrs.
Natural Sciences	8
ART 2410, 2510, 2610, 2810, or 2910 (Select one)	3
HIST 2010 Early United States History	3
ART 1250 Introduction to Digital Imaging.....	3
ART 2099 Professional Practices for the Artist	3
ART 2020 Art History Survey II	3
ART 3130 Art Since 1900	3
ART 3710 Intermediate Glass Studio.....	3
ART 3711 Intermediate Glass Studio.....	3
Total	32

Junior Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
HIST 2020 Modern United States History	3
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences and/or Humanities/Fine Arts Elective	3
ART 2000, 3150, 3160, 4040, 4100 or 4170 (Select two)	6
ART 2410, 2510, 2610, 2810, or 2910 (Select one)	3
ART 3710 or 3711	3
ART 3720 Advanced Glass Studio.....	3
ART 3730 or 4740.....	3
ART Studio Electives ³	2
Total	32

Senior Year	sem. hrs.
Social/Behavioral Science Elective and/or Humanities/Fine Arts Elective	3
ART 3721 Advanced Glass Studio.....	3
ART 4710 Senior Thesis in Glass	12
ART Studio Electives and/or Guided Electives ³	8
Total	26

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentrations in Clay, Fibers, Glass, Metals, Painting, and Wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

³ Art studio electives are defined as any art studio course not applied to other requirements. Allow up to 6 credits of guided electives including courses outside the Art curriculum, such as WEBD 1500, MKT 3400, MKT 3900.

METALS CONCENTRATION (BFAM)

(Leading to the Bachelor of Fine Arts Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Any General Education Math	3

Social/Behavioral Sciences and/or Humanities/Fine Arts Electives.....	6
ART 1045 Drawing I	3
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ART 1050, 2320 or 2330	3
ART 2810 Introduction to Metals.....	3
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	30

Sophomore Year	sem.
	hrs.
Natural Sciences	
ART 1250 Introduction to Digital Imaging.....	3
ART 2410, 2510, 2610, 2710, or 2910 (Select one)	3
HIST 2010 Early United States History.....	3
ART 3099 Professional Practices for the Artist.....	3
ART 2020 Art History Survey II	3
ART 3130 Art Since 1900.....	3
ART 3810 Metals Studio—Metalsmithing	3
ART 3820 Metals Studio—Blacksmithing	3
Total	32

Junior Year	sem.
	hrs.
ENGL 2130, 2235, or 2330.....	3
HIST 2020 Modern United States History.....	3
ART 2000, 3150, 3160, 4040, 4100, or 4170 (Select two)	6
ART 2410, 2510, 2610, 2710, or 2910 (Select one)	3
ART 3830 and 4840	3
ART 3811 or 3821	6
ART Studio Electives ³	2
COMM 2025 or PC 2500	3
Total	29

Senior Year	sem.
	hrs.
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives.....	6
ART 4810 Senior Thesis in Metals	12
ART Studio Electives and/or Guided Electives ³	8
Total	26

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentrations in Clay, Fibers, Glass, Metals, Painting, and Wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

³ Art studio electives are defined as any art studio course not applied to other requirements. Allow up to 6 credits of guided electives including courses outside the Art curriculum, such as WEBD 1500, MKT 3400, MKT 3900.

PAINTING CONCENTRATION (BFAP)

(Leading to the Bachelor of Fine Arts Degree)

Freshman Year	sem.
	hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Any General Education Math	3
Social/Behavioral Sciences or Humanities/Fine Arts Electives	6
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ART 1045 Drawing I.....	3
ART 1050 Drawing II.....	3
ART 2410 Painting I, Introduction	3
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	30

Sophomore Year	sem.
	hrs.
ART 2510, 2610, 2710, 2810, or 2910	3
Natural Sciences.....	8
HIST 2010 Early United States History	3
ART 1250 Introduction to Digital Imaging.....	3
ART 3099 Professional Practices for the Artist	3
ART 2020 Art History II	3
ART 3130 Art Since 1900	3
ART 3410 Painting II	3
ART 3420 Painting III	3
Total	32

Junior Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
HIST 2020 Modern United States History	3
COMM 2025 or PC 2500.....	3
ART 2510, 2610, 2710, 2810, or 2910	3
ART 3310 or 3320 or 4310 or 3421 or 3430	3
ART 3421 Painting IV.....	3
ART 3430 Independent Studies in Painting I	3
ART 3431 Independent Studies in Painting II	3
ART 2000, 3150, 3160, 4040, 4100, or 4170 (Select two)	6
ART Studio Electives ³	2
Total	32

Senior Year	sem.
	hrs.
Social/Behavioral Sciences or Humanities/Fine Arts Electives	6
ART 4410 Senior Thesis in Painting	12
ART Studio Electives and/or Guided Electives ³	8
Total	26

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentrations in Clay, Fibers, Glass, Metals, Painting and Wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

³ Art studio electives are defined as any art studio

course not applied to other requirements. Up to six hours guided electives may be chosen from:
WEBD 1500, MKT 3400, MKT 3900.

WOOD CONCENTRATION (BFAW)**(Leading to the Bachelor of Fine Arts Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives	6
Any General Education Math	3
ART 1340 Foundations Studio I	3
ART 1350 Foundations Studio II	3
ART 1045 Drawing I	3
ART 2330 Technical Drawing	3
ART 2910 Introduction to Woodworking	3
UNIV 1020 First-Year Connections or equivalent ¹	1
Total	31

Sophomore Year	sem. hrs.
Natural Sciences	8
HIST 2010 Early United States History	3
ART 1250 Introduction to Digital Imaging	3
ART 2410, 2510, 2610, 2710, or 2810 (Select one)	3
ART 1250 Introduction to Digital Images	3
ART 3099 Professional Practices for the Artist	3
ART 2020 Art History Survey II	3
ART 3130 Art Since 1900	3
ART 3910 Intermediate Wood Studio	3
ART 3911 Intermediate Wood Studio	3
Total	32

Junior Year	sem. hrs.
ART 2000, 3150, 3160, 4040, 4100, or 4170 (Select two)	6
ART 2410, 2510, 2610, 2710, or 2810 (Select one)	3
ART 3920 Advanced Wood Studio	3
ART 3921 Advanced Wood Studio	3
ART 3930 or 4940	3
ART 3940 Woodturning	3
ART Studio Electives ³	2
ENGL 2130, 2235, or 2330	3
HIST 2020 Modern United States History	3
COMM 2025 or PC 2500	3
Total	32

Senior Year	sem. hrs.
Social/Behavioral Sciences and/or Humanities/Fine Arts Electives	6
ART 4910 Senior Thesis in Wood	12
ART Studio Electives and/or Guided Electives ³	8
Total	26

¹ This course not included in 120-hour curriculum.

² Majors in BFA concentrations in Clay, Fibers, Glass, Metals, Painting, and Wood must have C or above in all art courses applied to fulfill

requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

³ Art studio electives are defined as any art studio course not applied to other requirements. Allow up to six hours guided electives may be chosen from: WEBD 1500, MKT 3400, MKT 3900.

BASIC BUSINESS (BBUS)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1130 College Algebra	3
MATH 1830 Applied Calculus	3
Natural Science ¹	8
DS 2810 Computer Applications in Business	3
Humanities/Fine Arts Elective ³	3
Electives ²	4
Total	30

Sophomore Year	sem. hrs.
ACCT 2110 Principles of Accounting I	3
ACCT 2120 Principles of Accounting II	3
ECON 2010 Principles of Microeconomics	3
ECON 2020 Principles of Macroeconomics	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
ENGL 2130, 2235, or 2330	3
Humanities/Fine Arts Elective ³	3
Electives ²	3
COMM 2025 or PC 2500	3
Total	30

¹ Select two courses from the following: ASTR 1010, 1020; BIOL 1010, 1020, 1123, 2310, 2010, 2020; CHEM 1010, 1020, 1110, 1120; GEOL 1040, 1045; PHYS 2010, 2020, 2110, 2120.

² Elective courses are to be selected in consultation with the academic advisor. UBUS 1020 may not be required in some instances. MATH 1000 and READ 1010 does not count as credit toward BSBA degree completion, including as elective. See advisor.

³ Select two courses from the University approved Humanities/Fine Arts list.

BASIC ENGINEERING (BE)

(The following first-year curriculum is recommended for students who have not selected a specific engineering discipline.)

Freshman Year	sem. hrs.
CSC 1300 Introduction to Problem Solving and Computer Programming	4
ENGR 1020 Connections to Engineering & Technology ²	1
ENGR 1110 Engineering Graphics ¹	2
ENGR 1120 Programming for Engineers ¹	2

ENGR 1210 Introduction to Engineering	1
CHEM 1110 General Chemistry I ¹	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
PHYS 2110 Calculus-based Physics I	4
Humanities/Fine Arts Electives and/or Social/Behavioral Science Electives	6
Total	33-35

¹ Students should consult with their advisor prior to taking ENGR 1110, ENGR 1120, CSC 1300 or PHYS 2110 to ensure the courses are applicable to the Engineering disciplines in which the student has potential interest.

² This course not included in 128-hour curriculum.

BIOLOGY (BIOL)

BIOLOGY CONCENTRATION

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods	1
BIOL 1113 General Biology I	4
BIOL 1123 Biology II	4
BIOL 2310 General Botany	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
MATH ¹	6
Total	33

Sophomore Year	sem. hrs.
GEOL 1040, 1045; or GEOL 1040, 2000; or PHYS 2010, 2020	7-8
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Electives	6
ENGL 2130, 2235, or 2330	3
PC 2500 or COMM 2025	3
MATH ¹	3
Total	28-29

Junior Year	sem. hrs.
BIOL 3120 or 3130 ²	3-4
BIOL 3140 Cellular Biology	4
BIOL 3200 General Microbiology	4
BIOL 3810 General Genetics	4
BIOL 3920 Biological Communication Skills	3
CHEM 3005 Elementary Organic Chemistry	4
Social/Behavioral Sciences Electives	6
Total	28-29

Senior Year	sem. hrs.
Approved Biology and Chemistry Courses ³	13-24
Electives	5-18
Total	29-30

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

² Students following the Microbiology option may choose between BIOL 3120 or 3130.

³ Students will take approved Biology and Chemistry courses from one of the following four options, each with unique requirements:

Botany Option: (18 hours)

1. BIOL 3240, 4150, 4320, 4330; and
2. Choose two of the three: BIOL 4300, 4310, 4780.

Marine Biology Option: (13-17 hours)

1. BIOL 4650; and
2. Choose one of the four: BIOL 4610, 4780, 4810, 4840; and
3. Two courses from the GCRL offerings (requires one summer at the Gulf Coast Research Laboratory; coursework from other marine stations may be substituted with the approval of the advisor.)

Microbiology Option: (18-24 hours)

1. BIOL 4130, 4150, 4750; and
2. CHEM 4610, 4620; and
3. Choose two courses from: BIOL 4000, 4040, 4120, 4140, 4160, 4780 or 4850.
or
1. BIOL 4130, 4150, 4750; and
2. CHEM 4500; and
3. Choose two courses from: BIOL 4000, 4040, 4120, 4160, 4780 or 4850.

Zoology Option: (16-28 hours)

1. BIOL 3040, 3530, and a choice of either BIOL 3330 or 4610; and
2. Choose two courses from: BIOL 3060, 3330, 4000, 4230, 4630, 4810, 4820 or 4830.

CELLULAR AND MOLECULAR BIOLOGY CONCENTRATION (BIBI)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods	1
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
BIOL 2310 General Botany	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
MATH ¹	6
Total	33

Sophomore Year	sem. hrs.
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHYS 2010 Algebra-based Physics I	4

PHYS 2020 Algebra-based Physics II	4
Humanities/Fine Arts Electives	6
ENGL 2130, 2235, or 2330	3
PC 2500 or COMM 2025	3
MATH ¹	3
Total	29

Junior Year	sem. hrs.
BIOL 3120 or 3130	3-4
BIOL 3140 Cellular Biology	4
BIOL 3200 General Microbiology	4
BIOL 3810 General Genetics	4
BIOL 3920 Biological Communication Skills	3
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
Social/Behavioral Sciences Elective	3
Total	29-30

Senior Year	sem. hrs.
BIOL 4150 Molecular Genetics	3
BIOL 4160 Genetic Engineering Laboratory	2
BIOL 4320 or 3530	3
BIOL 4040, 4060, or 4850	3
CHEM 4610 General Biochemistry I	3
CHEM 4620 General Biochemistry II	3
CHEM 4650 General Biochemistry Laboratory	2
Social/Behavioral Sciences Elective	3
Electives	6-7
Total	28-29

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

ENVIRONMENTAL BIOLOGY CONCENTRATION (BIEB)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods	1
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
BIOL 2310 General Botany	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
MATH ¹	6
Total	33

Sophomore Year	sem. hrs.
GEOL 1040 Physical Geology	4
GEOL 1045 or 2000	3-4
Humanities/Fine Arts Electives	6
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHYS 2010 Algebra-based Physics I	4
PC 2500 or COMM 2025	3
Total	29-30

Junior Year	sem. hrs.
BIOL 3130 General Ecology	4
BIOL 3140 Cellular Biology	4
BIOL 3200 General Microbiology	4
BIOL 3810 General Genetics	4
BIOL 3920 Biological Communication Skills	3
BIOL 3530 or 4320	3
CHEM 3005 Elementary Organic Chemistry	4
ESS 3710 or CHEM 4500	3
MATH ¹	3
Total	32

Senior Year	sem. hrs.
BIOL 3240 Field Botany	3
BIOL 4610 or 4840	3
BIOL 4630, 4810, 4820, or 4830	3
AGRN 2300 and 2310, BIOL 4330, GEOL 4150, or GEOL 4711	3-4
Social/Behavioral Sciences Electives	6
Electives	6-8
Total	24-27

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

HEALTH SCIENCES CONCENTRATION (BIHS)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods	1
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
BIOL 2310 General Botany	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
MATH ¹	6
Total	33

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I	4
BIOL 2020 Human Anatomy & Physiology II	4
ENGL 2130, 2235, or 2330	3
PHYS 2010 Algebra-based Physics I	4
PHYS 2020 Algebra-based Physics II	4
Humanities/Fine Arts Electives	6
MATH ¹	3
Total	28

Junior Year	sem. hrs.
BIOL 3120 or 3130	3-4
BIOL 3140 Cellular Biology	4
BIOL 3230 Health Science Microbiology	4
BIOL 3810 General Genetics	4
BIOL 3920 Biological Communication Skills	3
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4

PC 2500 or COMM 2025.....	3
Total	29-30

Senior Year	sem. hrs.
Biology Directed Electives ²	6-8
HIST 2010 Early United States History.....	9-12
HIST 2020 Modern United States History.....	3
PSY 1030 Introduction to Psychology	3
Social/Behavioral Sciences Elective.....	3
Electives	7-9
Total	29-30

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

² Choose two courses from: BIOL 3040, 3060, 4000, 4040, 4060, 4140, 4150, 4750 and CHEM 4610.

BUSINESS MANAGEMENT (BMGT)

BUSINESS AND INFORMATION TECHNOLOGY OPTION (BIT)

(Leading to the Bachelor of Science in Business Administration Degree)

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
BMGT 3510 Management & Organization Behavior ..	3
BMGT 3720 Business Communication I.....	3
DS 3620 Business Analytics: Data Driven Decision Making	3
DS 3841 Management Information Systems.....	3
DS 3850 Business Applications Development	3
DS 3860 Business Database Management	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance.....	3
MKT 3400 Principles of Marketing.....	3
DS elective	3
Total	30

Senior Year	sem. hrs.
BMGT 4930 Business Strategy	3
DS 3520 Operations Management.....	3
DS 3870 Business Applications Development II.....	3
DS 4250 Business Data Communications	3
DS 4330 Management Information Systems Analysis and Design.....	3
DS 4550 Information Systems Development Practicum	3
ECON 3320, 3810, or 3820	3
LAW 2810 Business Legal Environment and Ethics	3
Business elective ¹	3
Electives ¹	3
Total	30

¹ Elective courses are to be selected in

consultation with the academic advisor.

BUSINESS INTELLIGENCE AND ANALYTICS OPTION (BUBA)

(Leading to the Bachelor of Science in Business Administration Degree)

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
BMGT 3510 Management & Organization Behavior ..	3
ECON 3610 Business Statistics I.....	3
FIN 3210 Principles of Managerial Finance	3
MKT 3400 Principles of Marketing	3
DS 3620 Business Analytics: Data Driven Decision Making.....	3
DS 3860 Business Database Management	3
DS elective ⁴	3
Business Elective ⁴	3
Electives ²	3
<u>6</u> Total	30

Senior Year	sem. hrs.
ECON 3810, or 3820.....	3
DS 3841 Management Information Systems.....	3
BMGT 4930 Business Strategy.....	3
DS 4210 Business Intelligence.....	3
DS 3520 Operations Management	3
LAW 2810 Business Legal Environment and Ethics	3
ECON 4640 Econometrics	3
DS 4220 Advanced Business Analytics	3
DS 4510 Business Intelligence and Analytics Capstone.....	3
Business Elective ⁴	3
Total	30

⁴ DS and Business Electives must be approved by the academic advisor and be consistent with the intent of this concentration.

GENERAL MANAGEMENT OPTION (BUMA)**(Leading to the Bachelor of Science in Business Administration Degree)**

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
BMGT 3510 Management & Organization Behavior ..3	
BMGT 3600 International Management	3
BMGT 3630 Human Resource Management	3
DS 3620 Business Analytics: Data Driven Decision Making	3
DS 3841 Management Information Systems	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance	3
MKT 3400 Principles of Marketing	3
Business Elective ¹	3
DS elective	3
Total	30

Senior Year	sem. hrs.
BMGT 3720 Business Communication I	3
BMGT 4520 Organizational Leadership	3
BMGT 4930 Business Strategy	3
BMGT electives ¹	6
DS 3520 Operations Management	3
ECON 3320, 3810, or 3820	3
LAW 2810 Business Legal Environment and Ethics	3
Electives ¹	6
Total	30

¹ Elective courses are to be selected in consultation with the academic advisor.

HUMAN RESOURCE MANAGEMENT OPTION (BUHR)**(Leading to the Bachelor of Science in Business Administration Degree)**

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
BMGT 3510 Management & Organization Behavior ..3	
BMGT 3630 Human Resource Management	3
DS 3620 Business Analytics: Data Driven Decision Making	3
DS 3841 Management Information Systems	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance	3
LAW 2810 Business Legal Environment and Ethics	3
MKT 3400 Principles of Marketing	3
BMGT Electives	6
Total	30

Senior Year	sem. hrs.
BMGT 3720 Business Communication I	3
BMGT 4100 Staffing	3
BMGT 4120 Compensation Administration	3

BMGT 4150 Employment and Labor Law	3
BMGT 4610 Training and Development	3
BMGT 4930 Business Strategy	3
DS 3520 Operations Management	3
ECON 3320, 3810, or 3820	3
Business Elective ¹	3
Electives ¹	3
Total	30

¹ Elective courses are to be selected in consultation with the academic advisor.

PRODUCTION/OPERATIONS MANAGEMENT OPTION (BUPR)**(Leading to the Bachelor of Science in Business Administration Degree)**

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
BMGT 3510 Management & Organization Behavior ..3	
BMGT 3630 Human Resource Management	3
DS 3520 Operations Management	3
DS 3540 Quality & Productivity Systems	3
DS 3620 Business Analytics: Data Driven Decision Making	3
DS 3841 Management Information Systems	3
ACCT 3210 Cost Accounting	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance	3
MKT 3400 Principles of Marketing	3
Total	30

Senior Year	sem. hrs.
BMGT 3720 Business Communication I	3
BMGT 4410 Conflict Management & Negotiation	3
BMGT 4930 Business Strategy	3
DS or BMGT Electives ¹	6
ECON 3320, 3810, or 3820	3
LAW 2810 Business Legal Environment and Ethics	3
Business Electives ¹	6
MET Electives ¹	6
Total	30

¹ Elective courses are to be selected in consultation with the academic advisor.

CHEMICAL ENGINEERING (CHE)**(Leading to the Bachelor of Science in Chemical Engineering Degree)**

Freshman Year	sem. hrs.
CHE 1010 Introduction to Chemical Engineering ²	1
CHE 1020 Processes, Products and Ethics	1
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ENGR 1120 Programming for Engineers ¹	2
Humanities/Fine Arts Electives	6

MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
Total	29

Sophomore Year**sem.
hrs.**

CHE 2015 Introduction to Chemical and Biological Process Analysis and Scaling I	3
CHE 2020 Introduction to Chemical and Biological Process Analysis and Scaling II	3
CHE 3730 Chemical Engineering Operations	3
ENGL 2130, 2235, or 2330.....	3
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations	3
PHYS 2110 Calculus-based Physics I.....	4
PHYS 2120 Calculus-based Physics II.....	4
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences Elective.....	3
Total	33

Junior Year³**sem.
hrs.**

CHE 3010 Thermodynamics of Chemical Processes	3
CHE 3111 Transfer Science I: Conduction, Radiation and Diffusion.	4
CHE 3021 Separations and Solution Thermodynamics.....	4
CHE 3121 Transfer Science II: Fluid Mechanics	4
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
Social/Behavioral Science Elective	3
Technical Elective ⁴	3
CEE 2110, ECE 3810, or BIOL 3200	3
Total	35

Senior Year**sem.
hrs.**

CHE 4131 Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer.....	4
CHE 4210 Chemical Reaction Engineering.....	4
CHE 4240 Chemical Engineering Capstone Laboratory	1
CHE 4540 Process Dynamics & Control	3
CHE 4410 Process Design I.....	3
CHE 4420 Process Design II.....	3
CHE Technical Electives ⁵	6
CHEM 3510 Physical Chemistry	4
CHEM 3520 Physical Chemistry	4
Total	32

Senior Year (BS/MS Fast Track)⁶**sem.
hrs.**

CHE 4131 Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer.....	4
CHE 4210 Chemical Reaction Engineering.....	4
CHE 4240 Chemical Engineering Capstone Laboratory	1
CHE 4410 Process Design I.....	3
CHE 4420 Process Design II.....	3
CHE 4540 Process Dynamics & Control	3
CHE Technical Electives ⁵	6
CHE 4911 Professionalism and Ethics in Chemical Engineering—BS/MS Fast Track ⁷	1
CHE 5510, MS Elective ⁸	6
CHEM 3510 Physical Chemistry	4
CHEM 3520 Physical Chemistry	4

Total

39

Fifth Year (MS Program)⁸**NOTES:**

- ¹ ENGR 1120 must be MATLAB.
- ² This course not included in 128-hour curriculum.
- ³ Students must apply to the CHE Fast-Track MS program by the end of their second Junior term.
- ⁴ Three hours of Technical Electives can be from any of the following courses:
 - a. Any College of Engineering course at the 3000 or 4000 level.
 - b. Any BIOL/CHEM/MATH/PHYS at the 3000 or 4000 level.
 - c. Any course with the prior approval of the ChE Undergraduate Program Coordinator.
- ⁵ Six hours of ChE Technical Electives must come from one of the following courses:
 1. CHE 4245 Clinical Immersion
 2. CHE 4330 Polymer Engineering
 3. CHE 4335 Fuel Cells
 4. CHE 4440 Protein Engineering
 5. ChE 4661 Transport in Biochemical and Biological Processes
 6. ChE 4990 Undergraduate Research
- ⁶ Students enrolled in the Fast-Track BS/MS program must complete all requirements for both the BS and MS degrees as outlined in the Undergraduate and Graduate Catalogs, respectively. Students must meet all admission requirements to Graduate program.
- ⁷ Fast-Track ChE BS/MS students will register for ChE 4911 in which graduate research topics will be discussed.
- ⁸ Additional details to complete the BS/MS Fast-Track program are shown in the Graduate Catalog and are available in the Department of Chemical Engineering Office.

BIO-MOLECULAR ENGINEERING CONCENTRATION (BMOL)**(Leading to the Bachelor of Science in Chemical Engineering Degree)****Freshman Year****sem.
hrs.**

BIOL 1113 General Biology I	4
CHE 1010 Introduction to Chemical Engineering ¹	1
CHE 1020 Processes, Products and Ethics	1
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
ENGR 1120 Programming for Engineers	2
Total	30

Sophomore Year**sem.
hrs.**

CHE 2015 Introduction to Chemical and Biological Process Analysis and Scaling I	3
CHE 2020 Introduction to Chemical and Biological Process Analysis and Scaling II	3
CHE 3730 Chemical Engineering Operations	3

ENGL 2130, 2235 or 2330.....	3
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations	3
PHYS 2109 Calculus-based Physics I.....	3
PHYS 2119 Calculus-based Physics II.....	3
COMM 2025 or PC 2500.....	3
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Elective.....	3
Total	34

Junior Year ²	sem. hrs.
BIOL 3140 Cellular Biology	4
BIOL 3200 or 3230	4
CHE 3010 Thermodynamics of Chemical Processes	3
CHE 3111 Transfer Science I: Conduction, Radiation and Diffusion.	4
CHE 3021 Separations and Solution Thermodynamics.....	4
CHE 3121 Transfer Science II: Fluid Mechanics	4
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
CHEM 3510 Physical Chemistry I	4
Total	35

Senior Year	sem. hrs.
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Elective.....	3
CHE 4131 Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer.....	4
CHE 4210 Chemical Reaction Engineering.....	4
CHE 4240 Chemical Engineering Capstone Laboratory	1
CHE 4410 Process Design I.....	3
CHE 4420 Process Design II.....	3
CHE 4540 Process Dynamics & Control	3
CHE 4661 Transport in Biochemical and Biological Processes	3
CHEM 4610 General Biochemistry.....	3
Total	30

¹ Programming must be MATLAB.

² This course not included in 128-hour curriculum.

³ Students interested in the ChE Fast-Track MS program should apply by the end of their second junior term.

CHEMISTRY (CHEM)

APPLIED CHEMISTRY CONCENTRATION (CHMN)

(Leading to the Bachelor of Science Degree)

A student in any chemistry concentration may attain certification by the American Chemical Society as determined by the Chemistry faculty. The Chemistry Department defines specific areas of certification including, but not restricted to, pure chemistry, biochemistry and environmental chemistry. The requirements for certification in these areas are outside the curricular requirements of the three major concentrations. To attain ACS-certification within one of the following concentrations, a student must complete the following minimum requirements:

1. The student must take MATH 1920.
2. The student must take CHEM 2010, 3510, 4520, 4610, and 4991. CHEM 3510 and 4520 may be

substituted for 3500 and 3420, respectively, in curricula where the lower courses are required.

3. The student must take a minimum of three advanced courses chosen from: CHEM 3520, 4110, 4150, 4210, 4310, 4320, 4410, 4620, 4650, 4710, 4720.
4. The advanced courses above must include a minimum of three credit hours of laboratory including either CHEM 4150 or 4650.
5. Requirements for specific areas of certification can be obtained from the Chemistry Advisor.

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
MATH 1530 Introductory Statistics.....	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Humanities/Fine Arts Elective	3
CHEM 1500 First-Year Interactions & Advisement	1
Total	29

Sophomore Year	sem. hrs.
CHEM 2010 Introduction to Inorganic Chemistry	3
CHEM 3410 Quantitative Analysis	4
CHEM 3420 Analytical Applications	3
MATH 1910 Calculus I	4
PHYS 2010 Algebra-based Physics I.....	4
PHYS 2020 Algebra-based Physics II.....	4
Social/Behavioral Science Electives	6
Technical Requirements ¹	3
Total	31

Junior Year	sem. hrs.
CHEM 3500 Elements of Physical Chemistry	3
CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II.....	4
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
COMM 2025 or PC 2500.....	3
Technical Requirements ¹	7
Total	30

Senior Year	sem. hrs.
CHEM 4910 Chemistry Seminar	2
Advanced CHEM Courses ¹	9
Humanities/Fine Arts Elective	3
Technical Requirements ¹	3-5
Electives.....	11-12
Total	30

- ¹ Students will take chemistry (a) and technical requirements (b) from one of the six options below. Within certain options students should take the indicated social science (c) general education courses to satisfy prerequisites for technical requirements.
- Business Chemistry:
- a. Nine hours of advanced chemistry approved by the chemistry advisor.
 - b. ACCT 3720, BMGT 3510, FIN 3210, MKT

3400 plus 3 hours chosen from DS 3620 or LAW 2810.

c. ECON 2010 and 2020

Environmental Chemistry:

- a. CHEM 4710 and 4720 plus 3 hours of advanced chemistry approved by the chemistry advisor.
- b. BIOL 3120 plus 12 hours chosen from AGRN 3230, AGRN 4220, BIOL 4130, BIOL 4840, GEOG 4510, GEOL 4300 and 4711.

Forensic Chemistry:

- a. CHEM 4410, 4610 and 4650.
- b. CJ 2660, CJ 4250, BIOL 3330, BIOL 3810 and BIOL 4150.

Health Science Chemistry:

- a. CHEM 4610 and 4620 plus 3 hours of advanced chemistry approved by the chemistry advisor.
- b. BIOL 2010, BIOL 2020, BIOL 3230 plus 3 hours chosen from BIOL 3810, BIOL 4040, BIOL 4060 and BIOL 4150.

Industrial Chemistry:

- a. CHEM 4210, 4520 and 4710.
- b. COOP 2010, COOP 2020, COOP 2030, MET 1100, MET 2000, MET 3740, PC 3250 plus 3 hours chosen from ACCT 3720, COOP 4010, COOP 4020, COOP 4030, ME 3110 and MET 3080.

Chemistry:

- a. Nine hours of advanced chemistry approved by the Chemistry Advisor.
- b. A program of 14 hours of complementary coursework approved by the Chemistry Advisor.

- ² Pre-professional students majoring in Pre-Medicine, Pre-Dentistry, Pre-Pharmacy, Pre-Medical Technology, Pre-Cytotechnology, Pre-Optometry and Pre-Dental Hygiene electing to receive a Bachelor of Science Degree with a major in Chemistry from Tennessee Technological University may use the first year of coursework from an accredited professional school as their senior year after completing the first three years of this program as outlined above.

BIOCHEMISTRY CONCENTRATION (CHMB)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1910 Calculus I.....	4
Social/Behavioral Sciences Elective.....	3
CHEM 1500 First-Year Interactions & Advisement.....	1
Total	30

Sophomore Year	sem. hrs.
CHEM 3410 Quantitative Analysis	4
CHEM 3420 Analytical Applications	3
BIOL 3140 Cellular Biology	4

BIOL 3230 Health Science Microbiology.....	4
PHYS 2010 Algebra-based Physics I.....	4
PHYS 2020 Algebra-based Physics II.....	4
Humanities/Fine Arts Electives.....	6
Total	29

Junior Year	sem. hrs.
CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II.....	4
CHEM 3500 Elements of Physical Chemistry	3
BIOL 3810 General Genetics	4
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
COMM 2025 or PC 2500.....	3
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective	3
Total	30

Senior Year	sem. hrs.
CHEM 4610 General Biochemistry	3
CHEM 4620 General Biochemistry	3
CHEM 4650 General Biochemistry Lab	2
CHEM 4910 Chemistry Seminar	2
BIOL 4150 Molecular Genetics	3
BIOL Elective ¹	3
MATH 3070 Statistical Methods I.....	3
Electives.....	12
Total	31

¹Choose from BIOL 4040 or 4060.

PURE CONCENTRATION (CHMP)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Social/Behavioral Sciences Electives.....	6
CHEM 1500 First-Year Interactions & Advisement	1
Total	29

Sophomore Year	sem. hrs.
CHEM 2010 Introduction to Inorganic Chemistry	3
CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II.....	4
MATH 2110 Calculus III	4
MATH/PHYS Elective ¹	3
PHYS 2110 Calculus-based Physics I	4
PHYS 2120 Calculus-based Physics II	4
ENGL 2130, 2230 or 2330	3
Humanities/Fine Arts Elective	3
Total	32

Junior Year	sem. hrs.
CHEM 3510 Physical Chemistry	4
CHEM 3520 Physical Chemistry	4
CHEM 3410 Quantitative Analysis	4

HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
COMM 2025 or PC 2500.....	3
Humanities/Fine Arts Elective.....	3
Electives.....	6
Total	30

Senior Year

	sem. hrs.
CHEM 4110 Inorganic Chemistry	3
CHEM 4150 Inorganic Chemistry Lab	1
CHEM 4520 Instrumental Analysis	4
CHEM 4610 General Biochemistry	3
CHEM 4910 Chemistry Seminar	2
CHEM 4991 Undergraduate Research.....	1
CHEM Electives ²	6
Electives	9
Total	29

¹ Choose from MATH 2010, 2120, 3070 or PHYS 2920.

² Choose from CHEM 4210, 4310, 4320, 4410, 4620, 4650, 4710 and 4720.

CIVIL ENGINEERING (CE)

(Leading to the Bachelor of Science in Civil Engineering Degree)

Freshman Year

	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
ENGR 1110 Engineering Graphics.....	2
ENGR 1120 Programming for Engineers	2
Humanities/Fine Arts Electives.....	6
Natural Science ¹	8
CEE 1020 Connections to Civil and Environmental Engineering ²	1
Total	32

Sophomore Year

	sem. hrs.
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations	3
Natural Science ¹	4
CEE 2110 Statics	3
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences Electives.....	6
CEE 3020 Surveying	3
CEE 3110 Mechanics of Materials	3
ME 2330 Dynamics	3
ENGL 2130, 2235, or 2330.....	3
Total	35

Junior Year

	sem. hrs.
CEE 3030 Civil Engineering Materials.....	3
CEE 3320 Structural Mechanics.....	3
CEE 3413 Environmental Engineering	3
CEE 3420 Hydraulics	3
CEE 3610 Transportation Engineering.....	3
CEE 3720 or MATH 3470.....	2-3
CEE 4310 Structural Steel Design	3

GEOL 3210 Geology for Engineers.....	3
ME 3720 Fluid Mechanics	3
ECE 2010, ECE 3810, ME 3210, or ChE 3010	3
Approved CEE Lab Elective ⁶	1
MATH Elective ³	2
Total	33-34

Senior Year

	sem. hrs.
CEE 3710 Principles of Engineering Economy	2
CEE 4320 Reinforced Concrete Design.....	3
CEE 4800 Geotechnical Engineering.....	3
CEE 4920 Professionalism & Ethics	1
CEE 4940 Fundamentals of Civil Engineering	0
CEE 4950 Senior Design Project	3
Approved CEE Electives ⁴	9
Approved CEE Lab Elective ⁶	1
Approved CEE Sequence Electives ⁵	6
Total	28

¹ CHEM 1110 and PHYS 2110 are required. Students select either CHEM 1120 or PHYS 2120. Students who intend to pursue the environmental area of emphasis should take CHEM 1120.

² This course not included in 128-hour curriculum.

³ MATH 2010, 3810, 4210 or 4510.

⁴ Approved CEE Electives: CEE 3100, any 4000-level CEE course.

⁵ Approved CEE Sequences:

CEE 4130, 4160, 4190	Structural Mechanics
CEE 4130, 4350, 4360, 4380, 4700	Structural Engineering
CEE 4410, 4420, 4430, 4440, 4450	Environmental Engineering
CEE 4600, 4610, 4630, 4640, 4660	Transportation Engineering

⁶ Select 1 of the following 3 CEE lab courses: CEE 3040, CEE 3120, CEE 3430. Students who select or plan to select the structural mechanics or structures option should take CEE 3120; environmental students should take CEE 3430.

COMMUNICATION (COM)

NEWS EDITORIAL OPTION (JOUR)

(Leading to the Bachelor of Science Degree with a concentration in Journalism)

Freshman Year

	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
COMM 2025 Fundamentals of Communication	3
JOUR 2200 Mass Communication in a Changing Society	3
Laboratory Science	8
MATH	3
SOC 1010 Introduction to Sociology	3
GEOG 1012 Cultural Geography	3
Elective	1
UNIV 1020 First-Year Connections ¹	1
Total	30

Sophomore Year

	sem. hrs.
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ENGL 2330 Topics in World Literature.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
JOUR 2220 News Reporting & Copy Editing.....	3
JOUR 3350 Newspaper Production & Design.....	3
COMM 2090 Interpersonal Communication	3
JOUR 3400, 3500 or 3370.....	3
POLS 1030 American Government	3
JOUR 3740 Advertising Copy & Layout	3
JOUR 3460 Introduction to Public Relations	3
Total	30

Junior Year

sem.
hrs.

COMM 3100 Communication Theory	3
COMM 3200 Research Methods in Communication ..	3
Humanities/Fine Arts Elective.....	3
COMM 3620 Intercultural Communication.....	3
JOUR 3750 History of Journalism	3
JOUR 3770 Law of Journalism.....	3
Emphasis Area Courses.....	6
Electives	6
Total	30

Senior Year

sem.
hrs.

Humanities/Fine Arts Elective.....	3
JOUR 4710 or 4830	3
JOUR 4360 Magazine Production and Design	3
JOUR 4820 Advanced Reporting	3
JOUR 4930 Advanced Copy Editing	3
Emphasis Area Courses.....	6
PSY 1030 Introduction to Psychology	3
Electives	6
Total	30

¹ This course not included in 120-hour curriculum.

² Emphasis Area Courses

Agricultural Communications

The Agricultural Communications option is designed to prepare students for various careers in Communications in Agriculture.

Courses in Agricultural Communications.

Students take three of the following Agricultural courses and one internship:

AGBE 2010 World Food and Society
AGBE 2100 Economics of Agriculture
AGED 4150 (5150) Communications and Public Relations in Agricultural and Extended Education
JOUR 4853 (5853) Internship
JOUR 4856 (5856) Internship
JOUR 4859 (5859) Internship

Environmental Communications

The Environmental Communications option is designed to prepare students for various careers in appropriate communication areas and in newspapers, magazines and government to provide background and experience in preparing students for those careers, the curriculum places emphasis on practices and problems.

Courses in Environmental Communications.

Students take four of the following courses. Only one internship may count toward the four.

AGBE 2010 World Food and Society
AGBE 4120 (5120) Natural Resource Economics
ESS 3710 Chemistry and the Environment
GEOL 1045 Earth, Environment, Resources and Society
GEOL 2000 Earth Evolution and Life History
JOUR 4853 (5853) Internship
JOUR 4856 (5856) Internship
JOUR 4859 (5859) Internship
BIOL 3120 General Ecology

Digital Electronic Multi-Media

The Digital Electronic Multi-Media Option is designed to prepare students for various careers in the area of electronic publishing. The curriculum is characterized by an emphasis on analytical methods for business problem solving, information technology applications and electronic publishing, preparing students to serve as a web master for a newspaper, magazine or public relations department.

Courses in Digital Electronic Multi-Media.

Students take four of the following courses:

COMM 3000 Computer-Mediated Communication
COMM 3120 Visual Communication
COMM 4440 Semiotics
JOUR 4853 Internship

Sports Multi-Media Communications

The Sports Multi-Media Communications option is designed to prepare students for various careers in the area of sports. The curriculum is characterized by an emphasis on sports management and coaching to provide background and experience in sports communication preparing students for a career as a sports/columnist or in sports public relations. Hands-on experience in radio and television may be gained via internship.

Courses in Sports Multi-Media

Communications. Students may take four of the following courses. Only one internship may count toward the total of four.

EXPW 2170 Introduction to Sport Management
EXPW 3180 Introduction to Coaching
EXPW 3300 Sports Officiating
EXPW 4171 Exercise and Sport Psychology
EXPW 4540 Ethical Issues in Sport
EXPW 4550 Sport Governance
JOUR 4853 (5853) Internship
JOUR 4856 (5856) Internship
JOUR 4859 (5859) Internship

Writing Fiction and Non-Fiction

The Writing Fiction and Non-Fiction option is designed to extend students' writing experiences beyond the freelance writing course and also prepares them for additional experiences in fiction and non-fiction writing, according to their aspirations.

Courses in Writing Fiction and Non-Fiction.

Students take four of the following courses. Only one may include a special problems course.

ENGL 3400 Introduction to Creative Writing
 ENGL 4430 (5430) Creative Writing: Fiction
 ENGL 4440 (5440) Creative Writing: Essay
 ENGL 4450 (5450) Creative Writing: Poetry
 ENGL 4531 Grammar and Language
 JOUR 4843 (5843) Special Problems
 JOUR 4846 (5846) Special Problems
 JOUR 4949 (5849) Special Problems

Courses in Literature.

Students take four of the following courses:

ENGL 3500 Mythology
 ENGL 4111 (5111) Chaucer
 ENGL (THEA) 4121 (5121) Shakespeare
 ENGL 4130 (5130) Milton
 ENGL 4140 (5140) Topics in British Literature to 1667
 ENGL 4210 (5210) Eighteenth-Century British Literature
 ENGL 4221 (5221) Romantic Literature
 ENGL 4231 (5231) Victorian Literature
 ENGL 4240 (5240) Topics in British Literature after 1667
 ENGL 4250 (5250) Post Modern Literatures in English
 ENGL 4310 (5310) Early American Literature
 ENGL 4320 (5321) Nineteenth Century American Literature
 ENGL 4330 (5330) Modern American Literature
 ENGL 4340 (5340) Topics in American Literature
 ENGL 4610 (5610) Novel
 ENGL 4620 (5620) Poetry: Form, Genre, Theory
 ENGL 4630 (5630) Literary Criticism and Theory
 ENGL 4712 (5712) African American Literature
 ENGL 4713 (5713) Native American Literature
 ENGL 4720 (5720) Continental Literature
 ENGL 4731 (5731) Approaches to Women and Literature
 ENGL 4751 (5751) Topics in Non-Western Literature
 ENGL 4810 (5810) Introduction to Folklore
 ENGL 4820 Upper Cumberland Folklore
 ENGL 4830 (5830) Southern Literature
 ENGL 4840 (5840) The Gothic Tale of Terror
 ENGL 4911 (5911) The Literature of Science
 ENGL 4921 (5921) Literature and Technology
 ENGL 4931 (5931) Literature and the Environment

PUBLIC RELATIONS OPTION (JOUR)

(Leading to the Bachelor of Science Degree with a concentration in Journalism)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH.....	3
COMM 2025 Fundamentals of Communication	3
JOUR 2200 Mass Communication in a Changing Society.....	3
Natural Science.....	8
SOC 1010 Introduction to Sociology	3
GEOG 1012 Cultural Geography	3
Elective	1
UNIV 1020 First-Year Connections ¹	1
Total	30

Sophomore Year	sem. hrs.
ENGL 2330 Topics in World Literature.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
JOUR 2220 News Reporting & Copy Editing	3
JOUR 3350 Newspaper Production & Design.....	3
COMM 2090 Interpersonal Communication	3
JOUR 3400, 3500 or 3370	3
PSY 1030 Introduction to Psychology	3
JOUR 3740 Advertising Copy & Layout	3
JOUR 3460 Introduction to Public Relations	3
Total	30

Junior Year	sem. hrs.
COMM 3100 Communication Theory.....	3
COMM 3200 Research Methods in Communication ..	3
COMM 3620 Intercultural Communication	3
Humanities/Fine Arts Elective	3
JOUR 3470 Public Relations Writing.....	3
JOUR 3750 History of Journalism	3
JOUR 3770 Law of Journalism.....	3
Emphasis Area Courses	6
BMGT 3510 Management & Organization Behavior.....	3
Total	30

Senior Year	sem. hrs.
Humanities/Fine Arts Elective	3
JOUR 4710 or 4830	3
JOUR 4360 Magazine Production & Design	3
JOUR 4460 Public Relations--Cases & Practices	3
JOUR 4820 Advanced Reporting.....	3
JOUR 4930 Advanced Copy Editing	3
Emphasis Area Courses	6
PSY 3410 Group Dynamics	3
Electives.....	3
Total	30

¹ This course not included in 120-hour curriculum.

² Emphasis Area Courses

Agricultural Communications

The Agricultural Communications option is designed to prepare students for various careers in communications in agriculture.

Courses in Agricultural Communications. Students take three of the following agricultural courses and one internship:

AGBE 2010 World Food and Society
 AGBE 2100 Economics of Agriculture
 AGED 4150 (5150) Communications and Public Relations in Agricultural and Extension Education
 JOUR 4853 (5853) Internship
 JOUR 4856 (5856) Internship
 JOUR 4859 (5859) Internship

Environmental Communications

The Environmental Communications option is designed to prepare students for various careers in appropriate communication areas and in newspapers, magazines and government to provide background and experience in preparing students for those careers, the curriculum places emphasis on practices and problems.

Courses in Environmental Communications. Students take four of the following courses. Only one internship may count toward the four.

AGBE 2010 World Food and Society
 AGBE 4120 (5120) Natural Resource Economics
 ESS 3710 Chemistry and the Environment
 GEOL 1045 Earth, Environment, Resources, and Society
 GEOL 2000 Earth Evolution and Life History
 JOUR 4853 (5853) Internship
 JOUR 4856 (5856) Internship
 JOUR 4859 (5859) Internship
 BIOL 3120 General Ecology

Digital Electronic Multi-Media

The Digital Electronic Multi-Media option is designed to prepare students for various careers in the area of electronic publishing. The curriculum is characterized by an emphasis on analytical methods for business problem solving, information technology applications and electronic publishing, preparing students to serve as a web master for a newspaper, magazine or public relations department.

Courses in Digital Electronic Multi-Media. Students take four of the following courses:

COMM 3000 Computer-Mediated Communication
 COMM 3120 Visual Communication
 COMM 4440 Semiotics
 JOUR 4500 Advanced Multimedia Storytelling
 JOUR 4853 Internship

Sports Multi-Media Communications

The Sports Multi-Media Communications option is designed to prepare students for various careers in the area of sports. The curriculum is characterized by an emphasis on sports management and coaching to provide background and experience in sports communication preparing students for a career as a sports/columnist or in sports public relations. Hands-on experience in radio and television may be gained via internship.

Courses in Sports Multi-Media Communications. Students may take four of the following courses. Only one internship may count toward the total of four.

EXPW 2170 Introduction to Sport Management

EXPW 3180 Introduction to Coaching
 EXPW 3300 Sports Officiating
 EXPW 4171 Exercise and Sport Psychology
 EXPW 4540 Ethical Issues in Sport
 EXPW 4550 Sport Governance
 JOUR 4853 (5853) Internship
 JOUR 4856 (5856) Internship
 JOUR 4859 (5859) Internship

Writing Fiction and Non-Fiction

The Writing Fiction and Non-Fiction option is designed to extend students' writing experiences beyond the freelance writing course and also prepares them for additional experiences in fiction and non-fiction writing, according to their aspirations.

Courses in Writing Fiction and Non-Fiction. Students take four of the following courses. Only one may include a special problems course.

ENGL 3400 Introduction to Creative Writing
 ENGL 4430 (5430) Creative Writing: Fiction
 ENGL 4440 (5440) Creative Writing: Essay
 ENGL 4450 (5450) Creative Writing: Poetry
 ENGL 4531 Grammar and Language
 JOUR 4843 (5843) Special Problems
 JOUR 4846 (5846) Special Problems
 JOUR 4949 (5849) Special Problems

Courses in Literature.

Students take four of the following courses.

ENGL 3500 Mythology
 ENGL 4111 (5111) Chaucer
 ENGL (THEA) 4121 (5121) Shakespeare
 ENGL 4130 (5130) Milton
 ENGL 4140 (5141) Topics in British Literature to 1667
 ENGL 4210 (5210) Eighteenth-Century British Literature
 ENGL 4221 (5221) Romantic Literature
 ENGL 4231 (5231) Victorian Literature
 ENGL 4240 (5240) Topics in British Literature after 1667
 ENGL 4250 (5250) Post Modern Literatures in English
 ENGL 4310 (5310) Early American Literature
 ENGL 4320 (5321) Nineteenth Century American Literature
 ENGL 4330 (5330) Modern American Literature
 ENGL 4340 (5340) Topics in American Literature
 ENGL 4610 (5610) Novel
 ENGL 4620 (5620) Poetry: Form, Genre, Theory
 ENGL 4630 (5630) Literary Criticism and Theory
 ENGL 4712 (5712) African American Literature
 ENGL 4713 (5713) Native American Literature
 ENGL 4720 (5720) Continental Literature
 ENGL 4731 (5731) Approaches to Women and Literature
 ENGL 4751 (5751) Topics in Non-Western Literature
 ENGL 4810 (5810) Introduction to Folklore
 ENGL 4820 Upper Cumberland Folklore
 ENGL 4830 (5830) Southern Literature
 ENGL 4840 (5840) The Gothic Tale of Terror
 ENGL 4911 (5911) The Literature of Science
 ENGL 4921 (5921) Literature and Technology
 ENGL 4931 (5931) Literature and the Environment

COMMUNICATION STUDIES CONCENTRATION (CS)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Natural Science	8
MATH	3
Social/Behavioral Science Elective	3
COMM 2025 Fundamentals of Communication.....	3
JOUR 2200 Mass Communication in a Changing Society	3
COMM 1020 Foundations of Communication.....	3
UNIV 1020 First-Year Connections ⁵	1
Elective	1
Total	30

Sophomore Year	sem. hrs.
ENGL 2130, 2235 or 2330.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Electives.....	6
Social/Behavioral Science Elective	3
COMM 2075 Organizational Communication	3
COMM 2090 Interpersonal Communication	3
Electives ²	6
Total	30

Junior Year	sem. hrs.
COMM 3100 Communication Theory	3
COMM 3200 Research Methods in Communication ..	3
JOUR 3770 Law of Journalism.....	3
COMM 3620 Intercultural Communication.....	3
COM 3630 Discussion & Parliamentary Procedure....	3
Communication Application Elective ³	3
Communication Theory Electives ²	6
Mass Communication Application Elective ¹	3
Elective	3
Total	30

Senior Year	sem. hrs.
COMM 4620 Advanced Public Speaking	3
COMM 4630 Persuasion	3
Electives	12
Communication Application Electives ⁴	6
Communication Theory Electives ²	6
Total	30

¹ Students may choose from the following: JOUR 3400, JOUR 3460, JOUR 3750.

² Elective course to be selected in consultation with academic advisor.

³ Students may choose from the following: LING 4440, COMM 3000, COMM 3120, COMM 4410, COMM 4430, COMM 4603, COMM 4900.

⁴ Students may choose from the following: COMM 2800, COMM 3130, COMM 3400, COMM 4540, COMM 4550, COMM 4603, COMM 4850, COMM 4900.

⁵ This course is not included in the 120-hour curriculum.

COMPUTER ENGINEERING (CMPE)**(Leading to the Bachelor of Science in Computer Engineering Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
MATH 2010 Introduction to Linear Algebra	3
CHEM 1110 General Chemistry I.....	4
CSC 1300 Introduction to Problem Solving and Computer Programming.....	4
Social/Behavioral Sciences Elective ²	3
ECE 1020 Connections to Electrical and Computer Engineering ¹	1
Total	28

Sophomore Year	sem. hrs.
CSC 1310 Data Structures and Algorithms.....	4
ENGL 2130, 2235, or 2330	3
MATH 2110 Calculus III	4
MATH 2120 Differential Equations	3
PHYS 2110 Calculus-based Physics I	4
PHYS 2120 Calculus-based Physics II	4
CSC 2400 Design of Algorithms.....	3
ECE 2001 Computer-Aided Engineering in ECE.....	1
ECE 2010 Electric Circuits I	3
ECE 2011 Electrical Engineering Lab I	1
ECE 2020 Electric Circuits II	3
ECE 2110 Introduction to Digital Systems	3
Total	36

Junior Year	sem. hrs.
Humanities/Fine Arts Elective ²	3
COMM 2025 or PC 2500.....	3
CSC 2500 Unix Lab	1
CSC 4200 Computer Networks.....	3
EE Lab Elective.....	1
ECE 3010 Signals & Systems	3
ECE 3020 Discrete-time Signals and Systems	3
ECE 3060 Electrical Engineering Lab II	1
ECE 3130 Microcomputer Systems	4
ECE 3160 Digital Systems Lab	1
ECE 3300 Electronics I	3
ECE 3920 Professional Issues in Electrical and Computer Engineering	1
ECE 4140 Embedded System Design	3
MATH 3470 Introductory Probability and Statistics	3
Total	33

Senior Year	sem. hrs.
Humanities/Fine Arts Elective ²	3
Social/Behavioral Sciences Elective ²	3
CSC 4100 Operating Systems	3
ECE 4110 Digital System Design.....	3
ECE 4120 Fundamentals of Computer Design	3
ECE 4961 Capstone Design I	3
ECE 4971 Capstone Design II	3
EE Lab elective ³	1
CmpE Elective ³	3

CS Elective ³	3
EE Elective ³	3
Total	31

NOTES

- ¹ This course is not included in the 128-hour curriculum.
- ² Select from the University approved list.
- ³ Select from the ECE Department approved list.

COMPUTER SCIENCE (CSC)

CYBER-SECURITY CONCENTRATION (CSEC)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CSC 1300 Introduction to Problem Solving and Computer Programming	4
CSC 1310 Data Structures and Algorithms	4
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
Social/Behavioral Sciences Elective ²	3
ENGR 1020 Connections to Engineering and Technology ¹	1
Total	31

Sophomore Year	sem. hrs.
ENGL 2130, 2235 or 2330	3
COMM 2025 or PC 2500	3
First Science Sequence ³	8
CSC 2310 Object Oriented Programming and Design	4
CSC 2400 Design of Algorithms	3
CSC 2500 Unix Lab	1
CSC 2560 Networks for Information Technologists	3
CSC 2700 Discrete Structures for Computer Science	3
CSC 2710 Foundations of Computer Science	3
MATH 2010 Introduction to Linear Algebra	3
Total	34

Junior Year	sem. hrs.
Humanities/Fine Arts Elective ²	6
CSC 3040 Professionalism, Communication and Research in Computing	3
CSC 3300 Database Management Systems	3
CSC 3410 Computer Organization & Assembly Language Programming	3
CSC or Cyber-Security Elective	3
CSC 4320 Computer Architecture	3
CSC 4575 Information Assurance and Cryptography	3
Natural Science ⁴	4
MATH 3070 or MATH 3470	3
Total	31

Senior Year	sem. hrs.
Social/Behavioral Sciences Elective ²	3
CSC 4100 Operating Systems	3
CSC 4200 Computer Networks	3
CSC 4570 IT Security	3
CSC 4610 Software Engineering I	3
CSC 4620 Software Engineering II	3
CSC Elective	3
Electives	3
Total	24

- ¹ Not required for transfer students with more than 12 hours and not included in the 120-hour degree requirement.
- ² See TTU General Education Core Requirements.
- ³ Take at least one science sequence from BIOL 1113-1123, BIOL 1113-2310, CHEM 1110-1120, GEOL 1040-1045 or PHYS 2110-2120. The two sequences must be in different disciplines.
- ⁴ Must be a different discipline than the required science sequence.
- ⁵ At least 3 credit hours must come from the approved list of Cyber-Security Electives: CSC 3220, CSC 4220, CSC 4580, CSC 4760 (5760), CSC 4770, CJ 3640, DS 4125.

DATA SCIENCE CONCENTRATION (DS)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ENGR 1020 Connections to Engineering and Technology ¹	1
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
Social/Behavioral Sciences Elective ² (ECON 2010 or ECON 2020 recommended)	3
CSC 1300 Introduction to Problem Solving and Computer Programming	4
CSC 1310 Data Structures and Algorithms	4
Total	32

Sophomore Year	sem. hrs.
Science Sequence ³	8
COMM 2025 or PC 2500	3
CSC 2310 Object-Oriented Programming and Design	4
CSC 2400 Design of Algorithms	3
CSC 2500 Unix Lab	1
CSC 2700 Discrete Structures for Computer Science	3
CSC 2710 Foundations of Computer Science	3
ENGL 2130, 2235 or 2330	3
MATH 2010 Introduction to Linear Algebra	3
Total	31

Junior Year	sem. hrs.
Humanities/Fine Arts Elective ²	3

Natural Science	4
CSC 3040 Professionalism, Communication and Research in Computing.....	3
CSC 3220 Fundamentals of Data Science	3
CSC 3300 Database Management Systems	3
CSC 3410 Computer Organization & Assembly Language Programming.....	3
CSC 4320 Computer Architecture	3
CSC Elective	3
Data Science Application Elective ⁵	3
MATH 3070 or MATH 3470	3
Total	31

Senior Year

sem.
hrs.

Humanities/Fine Arts Elective ²	3
Social/Behavioral Science Electives ² (ECON 2010 or ECON 2020 recommended).....	3
CSC 4100 Operating Systems	3
CSC 4200 Computer Networks	3
CSC 4220 Data Mining and Machine Learning	3
CSC 4610 Software Engineering I.....	3
CSC 4620 Software Engineering II.....	3
CSC 4040 or CSC 4990	3
Data Science Technical Elective ⁵	3
Total	27

¹ Not required for transfer students with more than 12 hours and not included in the 120-hour degree requirement.

² See TTU General Education Core Requirements.

³ The sequence must be one of the following: BIOL 1113-1123, BIOL 1113-2310, CHEM 1110-1120, GEOL 1040-1045 or PHYS 2110-2120. The other lab science must be from a different discipline than the sequence.

⁴ Select from one of the following: CSC 3230, CSC 4575, GEOG 4510, MET 4650, MKT 3400 and BIOL 3810.

⁵ Select from one of the following: CSC 4240 or CSC 4760.

HIGH PERFORMANCE COMPUTING CONCENTRATION (HPC)

(Leading to the Bachelor of Science Degree)

Freshman Year

sem.
hrs.

ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CSC 1300 Introduction to Problem Solving and Computer Programming.....	4
CSC 1310 Data Structures and Algorithms	4
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
Social/Behavioral Science Elective ²	3
ENGR 1020 Connections to Engineering and Technology ¹	1
Total	31

Sophomore Year

sem.
hrs.

ENGL 2130, 2235 or 2330.....	3
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COMM 2025 or PC 2500.....	3
Science Sequence ³	8
CSC 2310 Object Oriented Programming and Design.....	4
CSC 2400 Design of Algorithms.....	3
CSC 2500 Unix Lab	1
CSC 2700 Discrete Structures for Computer Science	3
CSC 2710 Foundations of Computer Science	3
MATH 2010 Introduction to Linear Algebra	3
Total	31

Junior Year

sem.
hrs.

CSC 3040 Professionalism, Communication and Research in Computing	3
CSC 3220 Fundamentals of Data Science.....	3
CSC 3300 Database Management Systems.....	3
CSC 3410 Computer Organization & Assembly Language Programming	3
CSC 4200 Computer Networks.....	3
CSC 4320 Computer Architecture.....	3
CSC Elective	3
MATH 3070 or 3470.....	3
Natural Science.....	4
Social/Behavioral Sciences Elective ²	3
Total	31

Senior Year

sem.
hrs.

CSC 4100 Operating Systems	3
CSC 4610 Software Engineering I	3
CSC 4620 Software Engineering II	3
CSC 4760 Parallel Programming	3
CSC 4770 Distributed and Cloud Computing.....	3
PDH Technical Elective ⁴	3
Humanities/Fine Arts Electives ²	6
Electives.....	3
Total	27

¹ Not required for transfer students with more than 12 hours.

² See TTU General Education Core Requirements.

³ Take at least one science sequence from BIOL 1113-1123, BIOL 1113-2310, CHEM 1110-1120, GEOL 1040-1045 or PHYS 2110-2120.

⁴ Select from one of the following: CSC 4010, CSC 4420, and CSC 4400.

SOFTWARE AND SCIENTIFIC APPLICATIONS CONCENTRATION (CSSC)

(Leading to the Bachelor of Science Degree)

Freshman Year

sem.
hrs.

ENGL 1010 English Composition I	3
ENGL 1020 English Composition II.....	3
CSC 1300 Introduction to Problem Solving and Computer Programming.....	4
CSC 1310 Data Structures and Algorithms.....	4
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
Social/Behavioral Science Elective ²	3

ENGR 1020 Connections to Engineering and Technology ¹	1
Total	31

Sophomore Year

sem.

hrs.

ENGL 2130, 2235 or 2330.....	3
COMM 2025 or PC 2500.....	3
First Science Sequence ³	8
CSC 2310 Object Oriented Programming and Design	4
CSC 2400 Design of Algorithms.....	3
CSC 2500 Unix Laboratory.....	1
CSC 2700 Discrete Structures for Computer Science	3
CSC 2710 Foundations of Computer Science.....	3
MATH 2010 Introduction to Linear Algebra	3
Total	31

Junior Year

sem.

hrs.

Humanities/Fine Arts Elective ²	3
CSC 3040 Professionalism, Communication and Research in Computing.....	3
CSC 3300 Database Management Systems.....	3
CSC 3410 Computer Organization & Assembly Language Programming.....	3
CSC 4320 Computer Architecture	3
CSC Elective ⁵	3
CSC Upper Division Elective ⁴	3
MATH 3070 or 3470	3
Second Science Sequence ³	8
Total	31

Senior Year

sem.

hrs.

Social/Behavioral Sciences Elective ²	3
CSC 4100 Operating Systems	3
CSC 4200 Computer Networks	3
CSC 4610 Software Engineering I.....	3
CSC 4620 Software Engineering II.....	3
4000-level CSC Elective.....	3
Electives ⁵	9
Total	27

¹ Not required for transfer students with more than 12 hours.

² See TTU General Education Core Requirements.

³ Take at least one science sequence from BIOL 1113-1123, BIOL 1113-2310, CHEM 1110-1120, GEOL 1040-1045 or PHYS 2110-2120.

⁴ Take any additional 3000- or 4000-level CSC course except CSC 4990.

⁵ At least three elective hours need to be upper division.

EARLY CHILDHOOD (ECED)

(Leading to the Bachelor of Science Degree, Non-Licensure)

Freshman Year

sem.

hrs.

ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3

FOED 2011 Introduction to Teaching & Technology	2
FOED 1820 or 1822	1
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
BIOL 1080 Concepts of Biology	3
GEOL 1070 Concepts of Geology.....	3
HIST 2010 Early United States History	3
ART 1035 or MUS 1030.....	3
COMM 2025 or PC 2500.....	3
Total	30

Sophomore Year

sem.

hrs.

ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or 2330	3
HEC 2200 Development of Young Children: Conception to Age 9	3
CHEM 1310 Concepts of Chemistry	3
SOC 1010 or ANTH 1100	3
CFS 2400 Children with Special Needs	3
GEOG 1012 Cultural Geography	3
HEC 3520 Parent Education & Child Guidance	2
HIST 2020 Modern United States History	3
MUS 1074 Music to Meet Exceptional Education Needs.....	1
PHYS 1310 Concepts of Physics	3
Total	30

Junior Year

sem.

hrs.

CFS 3600 Family, Community & Professional Partnerships.....	2
READ 3311 Literacy I.....	7
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3810 Field Experiences in Education	2
ECSP 3001 Curriculum for Infants, Toddlers & Preschoolers	3
ECSP 3211 Practicum: Procedures for Infants, Toddlers & Preschoolers.....	1
ECED 4230 Early Intervention I	3
ECSP 4000 Developmentally Appropriate Practices: Birth-Preschool.....	3
ECED 4290 Community Connections	3
ECSP 4300 Assessment of Young Children	3
ESLP 4100 ESL M&M for PreK-12.....	3
HEC 2510 Creative Play	3
Total	36

Senior Year

sem.

hrs.

ECED 4240 Early Intervention II	3
ECED 4221 Earth Intervention Field Experience	1
ECED 4260 Early Childhood Program Leadership, Administration and Assessment.....	8
ECED 4270 Early Childhood Internship I	5
ECED 4280 Early Childhood Internship II	7
Total	24

¹ Overall, the program must include at least 36 hours of upper division.

² HEC majors and ECED non-licensure majors may take advisor approved upper division courses without admission to Teacher Education.

EARLY CHILDHOOD/SPECIAL EDUCATION, PREK-3 (ECSE)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
BIOL 1080, CHEM 1310, GEOL 1070, or PHYS 1310	6
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology	2
FOED 1820 or 1822	1
HIST 2010 Early United States History	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
MUS 1035 or ART 1030	3
COMM 2025 or PC 2500	3
Total	30

Sophomore Year	sem. hrs.
BIOL 1080, CHEM 1310, GEOL 1070, or PHYS 1310	6
HEC 2200 Development of Young Children: Conception to Age 6	3
CFS 2400 Children with Special Needs	3
ENGL 2235 or 2330	3
ENGL 2130 Topics in American Literature	3
GEOG 1012 Cultural Geography	3
HIST 2020 Modern United States History	3
HEC 3520 Parent Education & Child Guidance	2
MUS 1074 Music to Meet Exceptional Education Needs	1
SOC 1010 or ANTH 1100	3
Total	30

Junior Year	sem. hrs.
CFS 3600 Family, Community & Professional Partnerships	2
ECED 3301 Math, Science, Social Studies for the Young Child	7
ECED 3310 Practicum: Concepts for Young Children	1
ECSP 3001 Curriculum for Infants, Toddlers & Preschoolers	3
ECSP 3211 Practicum: Procedures for Infants, Toddlers & Preschoolers	1
ECSP 4000 Developmentally Appropriate Practices: Birth-Preschool	3
ECSP 4100 Developmentally Appropriate Practices: K-4	3
ESLP 4100 ESL Methodology and Materials for PreK-12	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3810 Field Experiences in Education	2
READ 3311 Literacy I	7
Total	35

Senior Year	sem. hrs.
ECSP 4300 Assessment of Young Children	3

ECSP 4871 Residency I	5
ECSP 4872 Professional Seminar I	5
ECSP 4881 Residency II	10
ECSP 4882 Professional Seminar II	2
Total	25

ECONOMICS (ECON)

(Leading to the Bachelor of Science in Business Administration Degree)

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
ECON 3810 Intermediate Microeconomics	3
ECON 3820 Intermediate Macroeconomics	3
BMGT 3510 Management & Organization Behavior ..	3
DS 3520 Operations Management	3
DS 3620 Business Analytics: Data Driven Decision Making	3
DS 3841 Management Information Systems	3
ECON 3320 Money & Banking	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance	3
LAW 2810 Business Legal Environment and Ethics ..	3
Total	30

Senior Year	sem. hrs.
BMGT 3720 Business Communication I	3
ECON 4510 or FIN 4910	3
ECON Electives	12
BMGT 4930 Business Strategy	3
MKT 3400 Principles of Marketing	3
Business Electives ¹	3
Elective ¹	3
Total	30

¹ Elective courses are to be selected in consultation with the academic advisor.

ELECTRICAL ENGINEERING (EE)

(Leading to the Bachelor of Science in Electrical Engineering Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
MATH 2010 Introduction to Linear Algebra	3
CHEM 1110 General Chemistry I	4
CSC 1300 Introduction to Problem Solving and Computer Programming	4
Social/Behavioral Sciences Elective ²	3
ECE 1020 Connections to Electrical and Computer Engineering ¹	1
Total	28

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500	3

ECE 2001 Computer-Aided Engineering in ECE.....	1
ECE 2010 Electric Circuits I	3
ECE 2011 Electrical Engineering Lab I	1
ECE 2020 Electric Circuits II	3
ECE 2110 Introduction to Digital Systems.....	3
MATH 2120 Differential Equations	3
MATH 2110 Calculus III.....	4
PHYS 2110 Calculus-based Physics I.....	4
PHYS 2120 Calculus-based Physics II.....	4
Social/Behavioral Sciences Elective.....	3
Total	35

Junior Year sem. hrs.

ECE 3010 Signals & Systems	3
ECE 3020 Discrete-Time Signals and Systems	3
ECE 3060 Electrical Engineering Lab II	1
ECE 3130 Microcomputer Systems.....	3
ECE 3300 Electronics I.....	3
ECE 3310 Electronics II.....	3
ECE 3510 Electromagnetic Fields I.....	3
ECE 3920 Professional Issues in Electrical and Computer Engineering	1
EE Breadth Electives ³	9
ECE Lab Elective ³	1
MATH 3470 Introductory Probability and Statistics	3
Total	34

Senior Year sem. hrs.

ECE 4961 Senior Capstone Design I	3
ECE 4971 Senior Capstone Design II	3
EE Depth Electives ³	6
EE Breadth Electives ³	3
EE Lab Electives ³	1
EE Senior Elective ³	3
Career Electives ³	6
Humanities/Fine Arts Electives ²	6
Total	31

¹ This course is not included in the 128-hour curriculum.

² Select from University approved list.

³ Select from ECE Department approved list.

MECHATRONICS CONCENTRATION (MECH)

(Leading to the Bachelor of Science in Electrical Engineering Degree)

Freshman Year sem. hrs.

CHEM 1110 General Chemistry I	4
CSC 1300 Introduction to Problem Solving and Computer Programming	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
MATH 2010 Introduction to Linear Algebra	3
Social/Behavioral Sciences Elective ²	3
ENGR 1110 Engineering Graphics.....	2
ECE 1020 Connections to Electrical and Computer Engineering ¹	1
Total	30

Sophomore Year sem. hrs.

ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500.....	3
CEE 2110 Statics	3
ECE 2001 Computer-Aided Engineering in ECE.....	1
ECE 2010 Electric Circuits I	3
ECE 2011 Electrical Engineering Lab I	1
ECE 2020 Electric Circuits II	3
ECE 2110 Introduction to Digital Systems	3
MATH 2110 Calculus III	4
MATH 2120 Differential Equations	3
PHYS 2110 Calculus-based Physics I	4
PHYS 2120 Calculus-based Physics II	4
Total	35

Junior Year sem. hrs.

ECE 3010 Signals & Systems	3
ECE 3020 Discrete-Time Signals and Systems	3
ECE 3060 Electrical Engineering Lab II	1
ECE 3130 Microcomputer Systems	4
ECE 3160 Digital Systems Lab	1
ECE 3210 Control Systems Analysis	3
ECE 3260 Control Systems Lab.....	1
ECE 3270 Programmable Logic Controller Lab	1
ECE 3300 Electronics I	3
ECE 3510 Electromagnetic Fields I.....	3
ECE 3610 Introduction to Power Systems	3
ECE 4140 Embedded System Design	3
ECE 3920 Professional Issues in Electrical and Computer Engineering	1
ME 2330 Dynamics	3
ME 3610 Dynamics of Machinery.....	3
Total	36

Senior Year sem. hrs.

Humanities/Fine Arts Electives ²	6
Social/Behavioral Sciences Electives ²	3
ECE 4210 Control System Design I	3
ECE 4961 Senior Capstone Design I.....	3
ECE 4971 Senior Capstone Design II	3
MATH 3470 Introductory Probability and Statistics	3
ME 4140 Introduction to Robotics and Intelligent Machines Engineering	3
EE Senior Elective ³	3
Total	27

¹ This course is not included in the 128-hour curriculum.

² Select from University approved list.

³ Select from ECE Department approved list.

ELEMENTARY EDUCATION (MSK5)

(Leading to the Bachelor of Science Degree and the Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year sem. hrs.

BIOL 1080 Concepts of Biology	3
CHEM 1310 Concepts of Chemistry	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3

FOED 2011 Introduction to Teaching & Technology ..2	
FOED 1820 or 1822	1
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
GEOG 1012 Cultural Geography.....	3
Total	30

Sophomore Year	sem.
	hrs.
EDPY 2210 Educational Psychology.....	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
HEC 3500 Development: Middle Childhood/Adolescence.....	3
COMM 2025 or PC 2500.....	3
GEOL 1070 Concepts of Geology	3
PHYS 1310 Concepts of Physics	3
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective.....	3
MATH Elective.....	3
Total	30

Junior Year	sem.
	hrs.
CUED 4700 Educational Data and Assessment.....	2
ECSP 4100 Developmentally Appropriate Practices: K-4.....	3
ELED 3140 Teaching of Social Studies.....	2
ELED 3152 Teaching of Mathematics	3
ELED 4142 Teaching of Science.....	3
ESLP 4100 ESL Methodology and Materials for PreK-12.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3800 Field Experiences in Education	2
FOED 3810 Field Experiences in Education	2
READ 3311 Literacy I.....	7
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Elective.....	2
Total	35

Senior Year	sem.
	hrs.
CUED 4800 Student Engagement.....	3
ELED 4871 Residency I	5
ELED 4872 Professional Seminar I	5
ELED 4881 Residency II	10
ELED 4882 Professional Seminar II	2
Total	25

ENGINEERING (ENGR)

(Leading to the Bachelor of Science in Engineering Degree)

Freshman Year	sem.
	hrs.
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ENGR 1020 Connections to Engineering & Technology.....	1
ENGR 1110 Engineering Graphics.....	2

ENGR 1120 Programming for Engineers.....	2
Humanities/Fine Arts Electives.....	6
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
Total	34

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
COMM 2025 Fundamentals of Communication	3
PHYS 2110 Calculus-based Physics I	4
PHYS 2120 Calculus-based Physics II	4
CEE 2110 Statics	3
CEE 3710 Principles of Engineering Economy	2
MATH 2010 Introduction to Linear Algebra	3
MATH 2110 Calculus III	4
MATH 2120 Differential Equations	3
ME 2330 Dynamics	3
Total	32

Junior Year	sem.
	hrs.
CEE 3110 Mechanics of Materials	3
CEE 3720 Engineering Statistics	2
ENGR 2810 Electrical Engineering Basics I.....	3
ENGR 2820 Electrical Engineering Basics II.....	3
ENGR 2821 Electrical Engineering Basics Lab.....	1
ENGR 3120 Solid Modeling	3
ME 3010 Materials and Processes in Manufacturing	3
ME 3023 Measurements in Mechanical Systems.....	3
ME 3210 Thermodynamics I	3
ME 3720 Fluid Mechanics	3
Social/Behavioral Sciences Electives.....	6
Total	33

Senior Year	sem.
	hrs.
CSC 3020 Numerical Methods.....	3
ENGR 4510 Engineering Management.....	3
ENGR 4900 Professionalism and Ethics.....	3
ENGR 4950 Senior Design I	3
ENGR 4960 Senior Design II	3
Technical Electives ¹	12
Elective	3
Total	27

¹ Technical Electives	
ENTC 4037	Quality Assurance I
ENTC 4060	Project Scheduling
MGMT 3000	Organizational Behavior and Management
MGMT 3100	Production/Operations Management
MGMT 4617	Small Business Management
ECE 3300	Electronics I
ME 3610	Dynamics of Machinery
ME 3710	Heat Transfer
ME 4010	Machine Design

ENGINEERING TECHNOLOGY (ET)

(Leading to the Bachelor of Science in Engineering Technology Degree)

Freshman Year	sem.
	hrs.
CHEM 1010 or 1110	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3

MATH 1730 Pre-calculus Mathematics	5
Humanities/Fine Arts Electives	6
MATH 1845 Technical Calculus	3
MET 1100 Introduction to Manufacturing Engineering Technology	2
ENGR 1110 Engineering Graphics	2
ENGR 1020 Connections to Engineering & Technology ¹	1
Total	29

Sophomore Year	sem. hrs.
ECON 2010 or 2020	3
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHYS 2010 or 2110	4
PHYS 2020 or 2120	4
CSC 1300 Introduction to Problem Solving and Computer Programming	4
MET 2000 Occupational Safety	2
MET 2065 Metal Manufacturing Technology	2
MET 2310 Applied Fluid Power	2
MET 2400 Statics and Strength Materials	3
Total	33

Junior Year	sem. hrs.
PC 2500 or COMM 2025	3
ACCT 3720 Survey of Accounting	3
BMGT 3510 Management & Organization Behavior	3
ECON 3610 Business Statistics I	3
ME 3010, MET 3100 or ME 3110	3
MET 3000 Principles of Metal Casting	2
MET 3150 Maintenance Technology I	2
MET 3200 Applied Electricity & Electronics	3
MET 3301 CAD for Technology	2
MET 3403 Applied Machine Elements	3
MET 3700 Manufacturing Cost Estimating	2
MET 3710 Methods Design and Work Measurement	2
Total	29

Senior Year	sem. hrs.
PSY 1030 Introduction to Psychology	3
Business Elective ³	3
DS 3520 Operations Management	3
MET 4310 Plant Layout & Materials Handling	3
MET 4615 Engineering Technology Ethics and Professionalism	1
MET 4620 Senior Projects	3
Area of Emphasis ⁴	15
Total	33

¹ This course not included in 123-hour curriculum.

² Business Electives: BMGT 3630, BMGT 4520, DS 3620, DS 3540, FIN 3210, LAW 2810 or MKT 3400.

³ Select one of the following concentrations (15 credits):

Concentration I – Mechatronics Engineering Technology

MET 3060, MET 3260, ECE 3270, MET 4250 and select two courses from: MET 3080, 3460, 4000, 4060, 4210, 4220, 4300, 4400, 4450, 4500, 4550, 4600, 4650, 4700, 4990, ESS 3710.

Concentration II – Engineering Technology

Management

Select five courses from: BMGT 3600, 3630, 4520, 4930; DS 3620, 3540; FIN 3210; LAW 2810; BMGT 4930; MET 4430; MKT 3400; PSY 3400.

ENGLISH (ENG)

CREATIVE WRITING CONCENTRATION (CW)

(Leading to the Bachelor of Arts Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Social/Behavioral Sciences Elective	3
Foreign Language ¹	6
Natural Science	8
Mathematics	3
COMM 2025 or PC 2500	3
Humanities/Fine Arts Elective	3
UNIV 1020 First-Year Connections	1
Total	33

Sophomore Year	sem. hrs.
ENGL 2330 Topics in World Literature	3
ENGL 3810 British Literature I	3
ENGL 3910 American Literature I	3
ENGL 3000 Introduction to English Methods & Research	3
HIST 2010 Early United States History	3
Social/Behavioral Sciences Elective	3
Foreign Language/Electives ¹	6
Electives	6
Total	30

Junior Year	sem. hrs.
ENGL 3820 British Literature II	3
ENGL 3920 American Literature II	3
ENGL 4121 Shakespeare	3
English (approved courses) ²	12
HIST 2020 Modern United States History	3
Humanities/Fine Arts Elective	3
Electives	3
Total	30

Senior Year	sem. hrs.
ENGL 4995 Senior Colloquium	3
English (approved courses) ²	18
Electives	6
Total	27

¹ English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and the Global Studies courses. Electives must include at least six credit hours in any Upper Division courses in FREN, GERM, SPAN (all excluding "Country and People"), HIST, PHIL, PSY, SOC, COMM or THEA.

² Choose one from the British Literature Block: ENGL 4111, 4130, 4140, 4210, 4221, 4231, 4240

Choose one from the American Literature Block:

ENGL 4310, 4320, 4330, 4340, 4830, 4712, 4713

Choose one from the Language Block:

ENGL 4511, 4521, 4531, 4541, 4561

The remaining 9 hours of upper-division ENGL courses must be taken from any ENGL courses 3000 or above EXCEPT core courses. The upper-division core courses are ENGL 3000, ENGL 3810, ENGL 3820, ENGL 3910, ENGL 3920, ENGL 4121, and ENGL 4995.

Students in the Writing, Literature or Drama concentrations can also have a concentration in Professional and Technical Communication by taking 21 elective hours in the following courses:

Professional Communication Core (9 hours)

PC 2500 Communicating in the Professions
PC 3250 Professional Communication I
PC 4850 Internship

15 Additional Credit Hours from the Following Courses

PC 3500 Rhetoric and the Internet
PC 3700 Information Design in the Professions
PC 3750 Ethics in the Professions
PC 4850 Internship
PC 4940 Technical Editing
PC 4970 Professional Communication I
PC 4990 Business and Grant Proposal Writing

LANGUAGE AND RHETORIC (RHET)**(Leading to the Bachelor of Arts Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
COMM 2025 Fundamentals of Communication.....	3
Foreign Language	6
Natural Science	8
Math	3
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Elective.....	3
UNIV 1020 First-Year Connections	1
Total	33

Sophomore Year	sem. hrs.
ENGL 2330 Topics in World Literature	3
ENGL 3810 British Literature I.....	3
ENGL 3910 American Literature I	3
ENGL 3000 Introduction to English Methods & Research.....	3
Foreign Language/Elective ¹	6
HIST 2010 Early United States History.....	3
Social/Behavioral Sciences Elective.....	3
Electives	6
Total	30

Junior Year	sem. hrs.
ENGL 3820 British Literature II.....	3
ENGL 3920 American Literature II	3
ENGL 4121 Shakespeare.....	3
English from block or courses at or above 3000-level ²⁹	

HIST 2020 Modern United States History	3
Humanities/Fine Arts Elective	3
Electives.....	6
Total	30

Senior Year	sem. Hrs.
ENGL 4995 Senior Colloquium	3
ENGL from blocks or courses at or above 3000-level.....	18
Electives.....	6
Total	27

¹ English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and the Global Studies courses. Electives must include at least six credit hours in any Upper Division courses in FREN, GERM, SPAN (all excluding "Country and People"), HIST, PHIL, PSY, SOC, COMM or THEA.

² Students choose courses from Blocks or courses at or above 3000-level as indicated below, for a total of 30 hours.

Language and Rhetoric Block (choose any five courses): ENGL 4411 (5411), ENGL 4421 (5421), ENGL 4551 (5451), ENGL 4511 (5511), ENGL 4521 (5521), ENGL 4531 (5531), ENGL 4541 (5541), ENGL 4561 (5561)

British Literature Block (choose one): ENGL 4111 (5111), ENGL 4130 (5130), ENGL 4140 (5140), ENGL 4210 (5210), ENGL 4221 (5221), ENGL 4231 (5231), ENGL 4240 (5240)

American Literature (choose one): ENGL 4310 (5310), ENGL 4320 (5321), ENGL 4330 (5330), ENGL 4340 (5340), ENGL 4712 (5712), ENGL 4713 (5713), ENGL 4830 (5830)

The remaining 9 hours of upper-division ENGL courses must be taken from any ENGL courses 3000 or above EXCEPT core courses. (The upper-division core courses are ENGL 3000, 3810, 3820, 3910, 3920, 4121 (5121), and 4995.)

Students in the language and rhetoric concentration can also have a concentration in professional and technical communication by taking 21 elective hours in the following courses: PC 2500 - Communicating in the Professions, PC 3250 - Professional Communication I, PC 4850 (5850) - Internship and 15 additional hours from the following: PC 3500, PC 3700, PC 3750, PC 4850 (5850), PC 4940 (5940), PC 4970 (5970), PC 4990 (5990).

LITERATURE CONCENTRATION (LITR)**(Leading to the Bachelor of Arts Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Social/Behavioral Sciences Elective	3
Foreign Language ¹	6
Natural Science	8

Mathematics	3
COMM 2025 or PC 2500	3
Humanities/Fine Arts Elective.....	3
UNIV 1020 First-Year Connections	1
Total	33

Sophomore Year

sem.
hrs.

ENGL 2330 Topics in World Literature	3
ENGL 3810 British Literature I.....	3
ENGL 3910 American Literature I	3
ENGL 3000 Introduction to English Methods & Research.....	3
HIST 2010 Early United States History.....	3
Social/Behavioral Sciences Elective.....	3
Foreign Language/Electives ¹	6
Electives	6
Total	30

Junior Year

sem.
hrs.

ENGL 3820 British Literature II.....	3
ENGL 3920 American Literature II	3
ENGL 4121 Shakespeare.....	3
English (approved courses) ²	9
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Elective.....	3
Electives	6
Total	30

Senior Year

sem.
hrs.

ENGL 4995 Senior Colloquium	3
English (approved courses) ²	15
Electives	9
Total	27

¹ English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and the Global Studies courses. Electives must include at least six credit hours in any Upper Division courses in FREN, GERM, SPAN (all excluding "Country and People"), HIST, PHIL, PSY, SOC, COMM or THEA.

² **Approved ENGL courses, one from each block:**

- British I: ENGL 4111, 4130, 4140
- British II: ENGL 4210, 4221, 4231, 4240, 4250
- American: ENGL 4310, 4320, 4330, 4340, 4830
- Culture/Genre: ENGL 4561, 4610, 4620, 4630, 4640, 4650, 4712, 4713, 4720, 4731, 4741, 4751, 4840
- Language: ENGL 4511, 4521, 4531, 4561
- Writing: ENGL 3400, 4411, 4421, 4430, 4440, 4551
- World Literature option:
- ENGL 4720 or 4751 (Culture block) 3
- Foreign Language upper division (one composition and two literature courses; exclude Country/People courses) 9

Students in the Writing, Literature or Drama concentrations can also have a concentration in Professional Communication by taking 21 elective hours in the following courses:

Professional Communication Core (9 hours)

PC 2500	Communicating in the Professions
PC 3250	Professional Communication I
PC 4850	Internship

15 Additional Credit Hours from the Following Courses

PC 3500	Rhetoric and the Internet
PC 3700	Information Design in the Professions
PC 3750	Ethics in the Professions
PC 4850	Internship
PC 4940	Technical Editing
PC 4970	Professional Communication I
PC 4990	Business and Grant Proposal Writing

PROFESSIONAL AND TECHNICAL COMMUNICATION CONCENTRATION (PTC)

(Leading to the Bachelor of Arts Degree)

Freshman Year

sem.
hrs.

ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH.....	3
PC 2500 Communicating in the Professions.....	3
Natural Science.....	8
UNIV 1020 First-Year Connections	1
Electives.....	6
Total	33

Sophomore Year

sem.
hrs.

ENGL 2330 Topics in World Literature.....	3
ENGL 3000 Introduction to English Methods & Research.....	3
ENGL 3810 British Literature I	3
ENGL 3820 British Literature II	3
PC 3250 Professional Communication I.....	3
Social/Behavioral Sciences Electives.....	6
Humanities/Fine Arts Elective	3
Electives.....	6
Total	30

Junior Year

sem.
hrs.

ENGL 3910 American Literature I	3
ENGL 3920 American Literature II	3
ENGL 4121 Shakespeare	3
PC 4850 Internship	3
Foreign Language	6
Humanities/Fine Arts Elective	3
Elective	3
PC 3500, 3700, 3750 or 4850 (3 or 6).....	6-9
Total	30-33

Senior Year

sem.
hrs.

English 4995 Senior Colloquium	3
Foreign Language	6
Electives.....	6
ENGL 4511, 4521, or 4531	3

PC 4940, 4970, 4850 (3 or 6), or 4990.....	6-9
Total	24-27

- ¹ English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and the Global Studies courses.

Students may use their 21 elective hours to pursue the following optional options:

Corporate Culture

BMGT 3510	Management and Organization Behavior	3
BMGT 3630	Human Resource Management	3
COMM 4420	Advanced Organizational Communication	3
COMM 4430	Advanced Interpersonal Communication	3
COMM 4630	Persuasion	3

Information Architecture

COMM 3120	Visual Communication/Rhetoric	3
WEBD 1500	Introduction to Web Design	3
WEBD 2300	Web Site Design: Dynamic Sites	3
WEBD 3500 or PC 3500		3

Scientific and Technical Writing

BIOL 3920	Biological Communication Skills	3
PC 4940	Technical Editing	3
Natural Science		8

THEATRE CONCENTRATION (THEA)

(Leading to the Bachelor of Arts Degree)

Performance Option

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Social/Behavioral Sciences Elective.....	3
Foreign Language.....	6
Natural Science.....	8
Mathematics.....	3
THEA 1030 Introduction to Theatre.....	3
UNIV 1020 First-Year Connections.....	1
Total	30

Sophomore Year	sem. hrs.
ENGL 2330 Topics in World Literature.....	3
ENGL 3810 British Literature I.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
THEA 1015 Acting I.....	3
COMM 2025 or PC 2500.....	3
Foreign Language.....	6
Social/Behavioral Sciences Elective.....	3
Total	30

Junior Year	sem. hrs.
ENGL 3000 Introduction to English Methods & Research.....	3
ENGL 3820 British Literature II.....	3
ENGL 3910 American Literature I.....	3
ENGL 3920 American Literature II.....	3
English Writing Course (3400, 4430, 4440, 4411,	

4421, or 4551.....	3
THEA 2015 Acting II.....	3
Directed THEA Electives ¹	6
Electives.....	6
Total	30

Senior Year

ENGL 4121 Shakespeare	3
ENGL 4640 Modern and Contemporary Drama	3
ENGL 4995 Senior Colloquium	3
English Language Studies Course (4511, 4521 or 4531	3
THEA 4300 Play Directing	3
Humanities/Fine Arts Elective	3
Electives.....	12
Total	30

¹ Select two Directed THEA Electives:

THEA 1025	Stagecraft I
THEA 2120	Theatre Production
THEA 3000	History of the Theatre
THEA 3001	Theatre Special Topics
THEA 3600	Film Studies
THEA 4100	Advanced Acting
THEA 4400	Dramatic Literature
THEA 4500	Creative Dramatics
THEA 4600	Theatre Internship

Students in the writing, literature or drama concentrations can also have a concentration in Professional Communication by taking 21 elective hours in the following courses:

PC 2500	Communicating in the Professions
PC 3250	Professional Communication I
PC 3700	Information Design in the Professions
PC 3750	Ethics in the Professions
PC 4850	Internship
PC 4940	Technical Editing
PC 4970	Professional Communication II
PC 4990	Business and Grant Proposal Writing

Technical Option

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Social/Behavioral Sciences Elective.....	3
Foreign Language.....	6
Natural Science.....	8
Mathematics.....	3
THEA 1030 Introduction to Theatre.....	3
UNIV 1020 First-Year Connections.....	1
Total	30

Sophomore Year	sem. hrs.
ENGL 2330 Topics in World Literature.....	3
ENGL 3810 British Literature I.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
THEA 1025 Stagecraft I.....	3
THEA 2025 Stagecraft II.....	3
COMM 2025 or PC 2500.....	3

Foreign Language	6
Social/Behavioral Sciences Elective.....	3
Total	30

Junior Year

sem.
hrs.

ENGL 3000 Introduction to English Methods & Research.....	3
ENGL 3820 British Literature II.....	3
ENGL 3910 American Literature I	3
ENGL 3920 American Literature II	3
English Writing Course (3400, 4430, 4440, 4411, 4421, or 4551	3
THEA 3200 Theatrical Design	3
Directed THEA Electives ¹	6
Electives	6
Total	30

Senior Year

sem.
hrs.

ENGL 4121 Shakespeare.....	3
ENGL 4640 Modern and Contemporary Drama	3
ENGL 4995 Senior Colloquium	3
English Language Studies Course (4511, 4521 or 4531	3
THEA 4300 Play Directing.....	3
Humanities/Fine Arts Elective.....	3
Electives	12
Total	30

¹ Select two Directed THEA Electives:

- THEA 1015 Acting I
- THEA 2110 Theatre Production
- THEA 3000 History of the Theatre
- THEA 3001 Theatre Special Topics
- THEA 3600 Film Studies
- THEA 4400 Dramatic Literature
- THEA 4500 Creative Dramatics
- THEA 4600 Theatre Internship

Students in the writing, literature or drama concentrations can also have a concentration in Professional Communication by taking 21 elective hours in the following courses:

- PC 2500 Communicating in the Professions
- PC 3250 Professional Communication I
- PC 3700 Information Design in the Professions
- PC 3750 Ethics in the Professions
- PC 4850 Internship
- PC 4940 Technical Editing
- PC 4970 Professional Communication II
- PC 4990 Business and Grant Proposal Writing

ENVIRONMENTAL AND SUSTAINABILITY STUDIES (ESS)

ENVIRONMENTAL SCIENCE CONCENTRATION (SCI)

BIOLOGY OPTION

(Leading to the Bachelor of Science Degree)

Freshman Year

sem.
hrs.

BIOL1010 or 1113	4
BIOL 1020 Diversity of Life.....	4

CHEM 1010 or CHEM 1110.....	4
CHEM 1020 Introductory Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
GEOL 1045 Earth Environment, Resources and Society	4
ESS 1100 Introduction to Environmental Studies	3
ESS 1020 Connections to Environmental and Sustainability Studies	1
Total	30

Sophomore Year

sem.
hrs.

ENGL 2130, 2235, or 2330	3
PC 2500 or COMM 2025.....	3
ECON 2010 Principles of Microeconomics	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Elective	3
MATH 1130, 1830 or 1910.....	3-4
PHIL 1030 Introduction to Philosophy	3
SOC 1010 Introduction to Sociology	3
AGRN 2300, 2310 Soils, Soil Chemical Properties....	4
BIOL 1123 Biology II	4
Total	35

Junior Year

sem.
hrs.

BIOL 2310 General Botany	4
BIOL 3120 or 3130.....	3-4
ESS 3000 Introduction to Environmental Law	3
ESS 3710 or CHEM 4710	3
GEOG 3200 Water Resources.....	3
HIST 3900 Environmental History	3
MATH 3070 Statistical Methods I.....	3
PHYS 2010 Algebra-based Physics I.....	4
SOC 3600 Environmental Sociology	3
Total	30

Senior Year

sem.
hrs.

AGBE 4120 Natural Resource Economics.....	3
BIOL 3140 or 3200 or 3810.....	4
ESS 4001 Society and the Environment: Capstone Experience Part 1	3
ESS 4002 Society and the Environment: Capstone Experience Part 2	3
Biology Option Elective	8
Electives.....	4
Total	25

¹ Biology Option Elective

One of the following:

- AGHT 3450 Dendrology
- BIOL 3240 Field Botany
- BIOL 4330 Plant Ecology

One of the following:

- GEOL 2000 Earth Evolution and Life History
- WFS 4500 National Wildlife Policy
- WFS 4730 Conservation Biology

One of the following:

- BIOL 4650 Marine Biology
- BIOL 4840 Limnology
- BIOL 4130 Environmental Biology

One of the following:

- BIOL 3330 Entomology
- BIOL 4230 Animal Behavior

BIOL 4610 Invertebrate Zoology
 BIOL 4630 Ornithology
 BIOL 4810 Ichthyology
 BIOL 4820 Mammalogy
 BIOL 4830 Herpetology

ENVIRONMENTAL SCIENCE CONCENTRATION (SCI)**CHEMISTRY OPTION****(Leading to the Bachelor of Science Degree)**

Freshman Year	sem.
	hrs.
BIOL 1020 Diversity of Life	4
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
GEOL 1045 Earth Environment, Resources and Society	4
Humanities/Fine Arts Elective	3
ESS 1100 Introduction to Environmental Studies	3
ESS 1020 Connections to Environmental and Sustainability Studies	1
Total	29

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
MATH 1130, 1830 or 1910	3-4
PHIL 1030 Introduction to Philosophy	3
SOC 1010 Introduction to Sociology	3
PC 2500 or COMM 2025	3
ECON 2010 Principles of Microeconomics	3
AGRN 2300, 2310 Soils, Soil Chemical Properties	4
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
Total	30

Junior Year	sem.
	hrs.
BIOL 3120 or 3130	3-4
CHEM 3410 Quantitative Analysis	3
CHEM 3500 Elements of Physical Chemistry	3
ESS 3000 Introduction to Environmental Law	3
GEOL 3200 Water Resources	3
HIST 2010 Early United States History	3
HIST 3900 Environmental History	3
MATH 3070 Statistical Methods I	3
PHYS 2010 Algebra-based Physics I	4
SOC 3600 Environmental Sociology	3
Total	33

Senior Year	sem.
	hrs.
AGBE 4120 Natural Resource Economics	3
CHEM 4710 Environmental Chemistry	3
CHEM 4720 Advanced Environmental Chemistry	3
ESS 4001 Society and the Environment: Capstone Experience Part 1	3
ESS 4002 Society and the Environment: Capstone Experience Part 2	3
HIST 2020 Modern United States History	3
Chemistry Option Elective	8
Elective	3
Total	29

- ¹ Chemistry Option Elective
 Two of the following:
 GEOL 4100 Environmental Sedimentology
 GEOL 4650 Applied Geochemistry
 GEOL 4711 Hydrogeology
 GEOG 4510 Theory of GIS, I
 GEOG 4650 Environmental Applications of GIS
 AGRN 3230 Environmental Soil Science
 AGRN 4220 Environmental Soil Chemistry
 BIOL 4130 Environmental Microbiology
 BIOL 4840 Limnology
 BIOL 4850 Applied Microbiology
 WFS 4500 National Wildlife Policy
 WFS 4730 Conservation Biology
 CHEM 4992 Undergraduate Research

ENVIRONMENTAL SCIENCE CONCENTRATION (SCI)**NATURAL RESOURCES OPTION****(Leading to the Bachelor of Science Degree)**

Freshman Year	sem.
	hrs.
BIOL 1020 Diversity of Life	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ESS 1020 Connections to Environmental and Sustainability Studies	1
ESS 1100 Introduction to Environmental Studies	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1130, 1830 or 1910	3-4
CHEM 1010 or 1110	4
Total	27

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
ESS 3710 or CHEM 4710	3-4
PC 2500 or COMM 2025	3
PHIL 1030 Introduction to Philosophy	3
SOC 1010 Introduction to Sociology	3
ECON 2010 Principles of Microeconomics	3
AGBE 2010 World Food and Society	3
GEOL 1045 Earth Environment, Resources and Society	4
Humanities/Fine Arts Elective	3
Total	29

Junior Year	sem.
	hrs.
AGBE 4120 Natural Resource Economics	3
AGRN 2300, 2310 Soils, Soil Chemical Properties	4
AGRN 3230 Environmental Soil Science	4
BIOL 3120 or 3130	3-4
ESS 3000 Introduction to Environmental Law	3
GEOG 3200 Water Resources	3
HIST 3900 Environmental History	3
MATH 3070 Statistical Methods I	3
PHYS 2010 Algebra-based Physics I	4
SOC 3600 Environmental Sociology	3
Total	32-33

Senior Year	sem. hrs.
ESS 4001 Society and the Environment: Capstone Experience Part 1.....	3
ESS 4002 Society and the Environment: Capstone Experience Part 2.....	3
Electives.....	8-11
Directed Electives.....	6
AGRN 4210, AGRN 4220, BIOL 4840, or GEOL 4150	3-4
Two of the following: AGBE 4130, or AGET 4720, or AGET 3110 and 3115.....	6
Total	30-31

Directed Electives

BIOL 4330 Plant Ecology
BIOL 4840 Limnology
GEOL 2000 Earth Evolution and Life History
GEOG 1010 Weather and Climate
GEOG 4510 Theory of GIS, I
GEOG 4650 Environmental Applications of GIS
WFS 4730 Conservation Biology

ENVIRONMENTAL TECHNOLOGY CONCENTRATION (TECH)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
PHIL 1030 Introduction to Philosophy	3
SOC 1010 Introduction to Sociology	3
ESS 1100 Introduction to Environmental Studies.....	3
ESS 1020 Connections to Environmental and Sustainability Studies	1
PHYS 2010 Algebra-based Physics I.....	4
Total	32

Sophomore Year	sem. hrs.
BIOL 1020 Diversity of Life.....	4
ENGL 2130, 2235, or 2330.....	3
PC 2500 or COMM 2025.....	3
ECON 2010 Principles of Microeconomics.....	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
Humanities/Fine Arts Elective.....	3
Elective.....	1
Total	27

Junior Year	sem. hrs.
BIOL 3120 or 3130	3-4
CEE 3413 Environmental Engineering.....	3
ESS 3710 or CHEM 4710.....	3-4
ESS 3000 Introduction to Environmental Law	3
GEOL 1045 Earth Environment, Resources, and Society	4
HIST 3900 Environmental History	3
MATH 3070 Statistical Methods I.....	3
SOC 3600 Environmental Sociology	3

Electives.....	6
Total	32

Senior Year	sem. hrs.
AGBE 4120 Natural Resource Economics.....	3
ESS 4001 Society and the Environment: Capstone Experience Part 1	3
ESS 4002 Society and the Environment: Capstone Experience Part 2	3
GEOG 4510 Theory of GIS, I.....	3
GEOG 4650 Environmental Applications of GIS.....	3
ET Tech Elective	6
Elective	8
Total	29

¹ Environmental Technology Electives
AGET 3510 Agricultural Surveying
AGET 3620 Computer Aided Design in Agriculture
AGET 2110 Agricultural Engineering Technology
BIOL 4130 Environmental Microbiology
BIOL 4840 Limnology
CEE 4410 Solid and Hazardous Waste Management
CEE 4430 Water and Wastewater Engineering
CEE 4450 Water Quality Modeling
ESS 4300 Environmental Management System
GEOG 1130 Geography of Natural Hazards
GEOG 4511 Theory of GIS, II
GEOL 4711 Hydrogeology
PHYS 2010 Algebra-based Physics I or PHYS 2110 Calculus-based Physics I
WFS 4500 National Wildlife Policy
WFS 4730 Conservation Biology

SOCIETY, CULTURE AND COMMUNICATION CONCENTRATION (SCC)

Freshman Year	sem. hrs.
BIOL 1020 Diversity of Life	4
CHEM 1010 or 1110	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHIL 1030 Introduction to Philosophy	3
POLS 1030 American Government.....	3
SOC 1010 Introduction to Sociology	3
ESS 1100 Introduction to Environmental Studies	3
ESS 1020 Connections to Environmental and Sustainability Studies	1
Total	33

Sophomore Year	sem. hrs.
ECON 2010 Principles of Microeconomics	3
ENGL 2130, 2235, or 2330	3
MATH 1130, 1830 or 1910.....	3-4
PC 2500 or COMM 2025.....	3
Humanities/Fine Arts Elective	3
JOUR 2200 Mass Communication in a Changing COMM 2075 Organizational Communication.....	3
Electives.....	6
ECS Elective	3
Total	30

Junior Year	sem. hrs.
BIOL 3120 or 3130	3-4
BMGT 3510 Management and Organization Behavior	3
ESS 3710 or CHEM 4710	3-4
ESS 3000 Introduction to Environmental Law	3
GEOL 1045 Earth Environment, Resources, and Society	4
HIST 3900 Environmental History	3
MATH 3070 Statistical Methods I	3
PC 3250 Professional Communication I	3
SOC 3600 Environmental Sociology	3
Elective	3
Total	32

Senior Year	sem. hrs.
AGBE 4120 Natural Resource Economics	3
ECON 4200 Environmental Economics	3
ESS 4001 Society and the Environment: Capstone Experience Part 1	3
ESS 4002 Society and the Environment: Capstone Experience Part 2	3
Elective	3
ECS Electives	8
Total	26

Select four courses from one of the following options for the ECS electives:

Communication and Media Option

JOUR 2220 News Reporting and Copy Editing
JOUR 3460 Introduction to Public Relations
PC 3700 Information Design in the Professions
PC 4970 Professional Communication II
COMM 3620 Intercultural Communication
COMM 4420 Advanced Organizational Communication
COMM 4630 Persuasion
WEBD 1500 Introduction to Web Design
WEBD 2300 Web Site Design: Dynamic Sites
ESS Internship

Social Science and Policy Option

GEOG 1035 or GEOG 1012 or GEOG 1130
POLS 3300 Introduction to Latin American Politics
POLS 3700 The Legislative Process
POLS 4610 Public Administration and Public Policies
SOC 3720 Rural Sociology
SOC 4090 Cross Cultural Communications and
Cultural Diversity
SOC 4330 Population and Social Process
SOC 4860 Social Movements and Social Change
ESS 4900 Internship

Leadership and Environmental Management Option

COMM 4410 Advanced Organizational Communication
PADM 4226 Intro to Nonprofit Organizations
PSY 3590 Psychology of Personality
ESS 4300 Environmental Management System

EXERCISE SCIENCE, PHYSICAL EDUCATION AND WELLNESS (EXPW)

FITNESS AND WELLNESS CONCENTRATION (FW)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
BIOL 1010 Introduction to Biology	4
BIOL 1020 Diversity of Life	4
EXPW 1021 Connection to Exercise Science	1
EXPW 1022 Introduction to Exercise Science	2
EXPW 1150 Care & Prevention of Athletic Injuries	3
Humanities/Fine Arts Elective	3
HEC 1030 Introduction to Nutrition	2
PSY 1030 Introduction to Psychology	3
MATH 1530 Introductory Statistics	3
PHED 1002 Physical Fitness Test	0
Total	31

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I	4
BIOL 2020 Human Anatomy & Physiology II	4
ENGL 2130 Topics in American Literature	3
EXPW 2160 Drug Use and Abuse	2
EXPW 2430 First Aid, Safety & CPR	2
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective	3
Electives	6
PHED 1002 Physical Fitness Test	0
Total	33

Junior Year	sem. hrs.
EXPW 2150 Human Sexuality	3
EXPW 3032 Exercise Prescription for Fitness & Wellness	3
EXPW 3170 Motor Learning	3
EXPW 3410 Lifespan Motor Development	3
EXPW 4171 Exercise & Sport Psychology	3
EXPW 4420 Kinesiology	3
COMM 2025 or PC 2500	3
Electives	6
PHED 1002 Physical Fitness Test	0
Total	27

Senior Year	sem. hrs.
BMGT 3510 Management of Organization Behavior	3
EXPW 4032 Training for Performance	3
EXPW 4042 Health Promotion	3
EXPW 4210 Gerontology	3
EXPW 4440 Physiology of Exercise	3
EXPW 4520 Adapted Physical Activity and Sport	3
EXPW 4730 Assessment & Evaluation in EXPW	3
EXPW 4810 Field Experience	3
EXPW 4900 Research Methods in Exercise Science	3
Electives	2
PHED 1002 Physical Fitness Test	0
Total	29

LICENSURE CONCENTRATION (L)**(Leading to the Bachelor of Science Degree and the
Apprentice License, with endorsement, Grades K-12)**

Freshman Year	sem. hrs.
BIOL1010 Introduction to Biology I.....	4
BIOL 1020 Diversity of Life.....	4
EDPY 2210 Educational Psychology.....	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
EXPW 1021 Connection to Exercise Science.....	1
EXPW 1022 Introduction to Exercise Science.....	2
EXPW 2130 Concepts of Comprehensive Health.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
MATH.....	3
PSY 1030 Introduction to Psychology.....	3
PHED 1002 Physical Fitness Test.....	0
Total	31

Sophomore Year	sem. hrs.
BIOL 2350 Introductory Anatomy & Physiology.....	4
ENGL 2130, 2235, or 2330.....	3
EXPW 2150 Human Sexuality.....	3
EXPW 2430 First Aid, Safety and CPR.....	2
EXPW 3012 Educational Gymnastics, Dance & Fitness.....	1
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Electives.....	6
PC 2500 or COMM 2025.....	3
Social/Behavioral Sciences Elective.....	3
PHED 1002 Physical Fitness Test.....	0
Total	31

Junior Year	sem. hrs.
EXPW 3132 School Health Pedagogy and Practicum.....	3
EXPW 3170 Motor Learning.....	3
EXPW 3410 Lifespan Motor Development.....	3
EXPW 3560 Techniques and Tactics of Sports.....	2
EXPW 3720 Instructional Strategies.....	3
EXPW 4420 Kinesiology.....	3
EXPW 4440 Physiology of Exercise.....	3
EXPW 4711 Analysis and Development of Sport Skills.....	4
EXPW 4721 Methods of Elementary Movement.....	4
EXPW 4731 Assessment in the Physical Education Classroom.....	2
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
PHED 1002 Physical Fitness Test.....	0
Total	33

Senior Year	sem. hrs.
EXPW 3660 Curriculum in Physical Education.....	2
EXPW 4520 Adapted Physical Activity and Sport.....	3
EXPW 4871 Residency I.....	5
EXPW 4873 Professional Seminar I.....	3
EXPW 4881 Residency II.....	10
EXPW 4882 Professional Seminar II.....	2
PHED 1002 Physical Fitness Test.....	0
Total	25

PRE-ATHLETIC TRAINING CONCENTRATION (PAT)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
BIOL 1010 Introduction to Biology I.....	4
BIOL 1020 Diversity of Life.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
EXPW 1021 Connection to Exercise Science.....	1
EXPW 1022 Introduction to Exercise Science.....	2
EXPW 1110 Introduction to Athletic Training.....	1
EXPW 1150 Care & Prevention of Athletic Injuries....	3
EXPW 2130 Concepts of Comprehensive Health.....	3
MATH 1530 Introductory Statistics.....	3
PSY 1030 Introduction to Psychology.....	3
Social/Behavioral Sciences Elective ¹	3
PHED 1002 Physical Fitness Test.....	0
Total	33

Sophomore Year	sem. hrs.
BIOL 2010 Anatomy & Physiology I.....	4
BIOL 2020 Anatomy & Physiology II.....	4
HEC 1030 Introduction to Nutrition.....	2
ENGL 2130, 2235, or 2330.....	3
Humanities/Fine Arts Electives ²	6
EXPW 2001 Orthopedic Assessment I.....	4
EXPW 2002 Orthopedic Assessment II.....	4
EXPW 2430 First Aid & CPR.....	2
HEC 2220 Medical Terminology.....	1
PHED 1002 Physical Fitness Test.....	0
Total	30

Junior Year	sem. hrs.
COMM 2025 or PC 2500.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
EXPW 3001 Therapeutic Rehabilitation & Modalities.....	3
EXPW 3006 Medical Aspects of Athletic Training.....	3
EXPW 3011 Clinical I.....	3
EXPW 3032 Exercise Prescription.....	3
EXPW 3170 Motor Learning.....	3
EXPW 4730 Assessment in Exercise Science.....	3
Elective.....	3
PHED 1002 Physical Fitness Test.....	0
Total	30

Senior Year	sem. hrs.
EXPW 3410 Lifespan Motor Development.....	3
EXPW 4001 Senior Seminar.....	3
EXPW 4011 Clinical II.....	3

EXPW 4420 Kinesiology.....	3
EXPW 4440 Physiology of Exercise.....	3
EXPW 4530 Organization & Administration of Interschool Athletics	3
NURS 4230 Pharmacological Concepts in Nursing II.....	2
Electives.....	7
PHED 1002 Physical Fitness Test.....	0
Total	27

¹ Select a social/behavioral science elective from the following list: ANTH 1100, ECON 2010, ECON 2020, GEOG 1012, POLS 1030 or SOC 1010.

² Select a humanities/fine arts elective from the following list: PHIL 1030, HIST 2310, HIST 2320, THEA 1030, MUS 1030, ART 1035, ENGL 2235 or ENGL 2330.

PRE-OCCUPATIONAL THERAPY CONCENTRATION (OT)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1530 Introductory Statistics.....	3
MATH 1130 or 1710.....	3
DS 2810 Computer Applications in Business	3
EXPW 1021 Connection to Exercise Science	1
EXPW 1022 Introduction to Exercise Science.....	2
EXPW 1150 Care & Prevention of Athletic Injuries	3
Electives.....	8
PHED 1002 Physical Fitness Test.....	0
SOC 1010 Introduction to Sociology	3
Total	32

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 2020 Human Anatomy & Physiology II.....	4
ENGL 2130, 2235, or 2330.....	3
HEC 1030 Introduction to Nutrition.....	2
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Elective ¹	3
PSY 1030 Introduction to Psychology	3
COMM 2025 or PC 2500.....	3
PHED 1002 Physical Fitness Test.....	0
Elective.....	3
Total	31

Junior Year	sem. hrs.
EXPW 2130 Concepts of Comprehensive Health	3
EXPW 2430 First Aid, Safety & CPR.....	2
EXPW 3032 Exercise Prescription for Fitness & Wellness.....	3
EXPW 3170 Motor Learning.....	3
EXPW 3410 Lifespan Motor Development.....	3
EXPW 4171 Exercise & Sports Psychology	3
Humanities/Fine Arts Elective ¹	3
PHED 1002 Physical Fitness Test.....	0
SPED 3031 Physical Management and Support Services for Orthopedic, Motor and Health Impaired.....	3

Electives.....	8
Total	31

Senior Year	sem. hrs.
EXPW 4210 Gerontology	3
EXPW 4420 Kinesiology	3
EXPW 4440 Physiology of Exercise.....	3
EXPW 4520 Adapted Physical Activity and Sport	3
EXPW 4730 Assessment & Evaluation in EXPW.....	3
EXPW 4810 Field Experience.....	3
EXPW 4900 Research Methods in Exercise Science	3
Electives.....	5
PHED 1002 Physical Fitness Test	0
Total	26

¹ Select a Humanities/Fine Arts Elective.

Directed Electives

ANTH 1100	Introduction to Anthropology	3
BIOL 1113	General Biology I	4
BIOL 1123	General Biology II	4
BIOL 3140	Cellular Biology	4
BIOL 3230	Health Science Microbiology	4
CHEM 1110	General Chemistry I	4
CHEM 1120	General Chemistry II	4
HEC 2220	Medical Terminology for the Human Sciences	1
HIT 1010	Medical Terminology (TN eCampus)	3
PHYS 2010	Algebra-based Physics I	4
PHYS 2020	Algebra-based Physics II	4
PSY 2130	Life Span Developmental Psychology	3
PSY 4160	Abnormal Psychology	3
SOCI 1120	Introduction to Cultural Anthropology (TN eCampus)	3

PRE-PHYSICAL THERAPY CONCENTRATION (PT)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
EXPW 1021 Connection to Exercise Science	1
EXPW 1022 Introduction to Exercise Science	2
EXPW 1150 Care & Prevention of Athletic Injuries	3
HEC 1030 Introduction to Nutrition.....	2
MATH 1530 Introductory Statistics.....	3
MATH 1130 or 1710	3
SOC 1010 Introduction to Sociology	3
Electives.....	8
PHED 1002 Physical Fitness Test	0
Total	31

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 2020 Human Anatomy & Physiology II.....	4

ENGL 2130, 2235, or 2330.....	3
EXPW 2430 First Aid, Safety & CPR.....	2
PSY 1030 Introduction to Psychology	3
COMM 2025 or PC 2500.....	3
Humanities/Fine Arts Elective ¹	3
Electives	7
PHED 1002 Physical Fitness Test.....	0
Total	29

Junior Year **sem.**
hrs.

HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
EXPW 3032 Exercise Prescription for Fitness & Wellness.....	3
EXPW 3410 Lifespan Motor Development	3
EXPW 3170 Motor Learning.....	3
EXPW 4171 Exercise & Sports Psychology	3
EXPW 4210 Gerontology	3
Electives	11
PHED 1002 Physical Fitness Test.....	0
Total	32

Senior Year **sem.**
hrs.

EXPW 4420 Kinesiology.....	3
EXPW 4440 Physiology of Exercise	3
EXPW 4520 Adapted Physical Activity and Sport	3
EXPW 4730 Assessment & Evaluation in EXPW	3
EXPW 4810 Field Experience	3
EXPW 4900 Research Methods in Exercise Science.....	3
SPED 3031 Physical Management & Support Services for Orthopedic, Motor and Health Impaired	3
DS 2810 Computer Applications in Business	3
Humanities/Fine Arts Elective ¹	3
Elective.....	1
PHED 1002 Physical Fitness Test.....	0
Total	28

¹ Select a humanities/fine arts elective.

BIOL 1113	General Biology I	4
BIOL 1123	General Biology II	4
BIOL 3140	Cellular Biology	4
BIOL 3230	Health Sciences Microbiology	4
CHEM 1110	General Chemistry I	4
CHEM 1120	General Chemistry II	4
HEC 2220	Medical Terminology for the Human Sciences	1
HIT 1010	Medical Terminology (TN eCampus)	3
PHYS 2010	Algebra-based Physics I	4
PHYS 2020	Algebra-based Physics II	4
PSY 2130	Life Span Developmental Psychology	3
PSY 4160	Abnormal Psychology	3

PRE-PHYSICIAN ASSISTANT

(Leading to the Bachelor of Science Degree)

Freshman Year **sem.**
hrs.

CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II.....	4

ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
EXPW 1021 Connection to Exercise Science	1
EXPW 1022 Introduction to Exercise Science	2
EXPW 1150 Care & Prevention of Athletic Injuries	3
HEC 1030 Introduction to Nutrition.....	2
MATH 1130 College Algebra	3
PSY 1030 Introduction to Psychology	3
SOC 1010 Introduction to Sociology	3
Total	31

Sophomore Year **sem.**
hrs.

BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 2020 Human Anatomy & Physiology II.....	4
ENGL 2130 Topics in American Literature	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1530 Introductory Statistics.....	3
COMM 2025 Fundamentals of Communication	3
Humanities/Fine Arts Electives.....	6
PHED 1002 Physical Fitness Test	0
Total	29

Junior Year **sem.**
hrs.

BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
BIOL 3230 Health Science Microbiology.....	4
BIOL 3810 General Genetics	4
EXPW 3032 Exercise Prescription for Fitness & Wellness	3
EXPW 3410 or EXPW 3170.....	3
EXPW 4171 Exercise & Sports Psychology.....	3
HEC 2220 Medical Terminology for the Human Sciences	1
PSY 2130 Life Span Development Psychology	3
Electives.....	3
PHED 1002 Physical Fitness Test	0
Total	31

Senior Year **sem.**
hrs.

CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II	4
EXPW 4420 Kinesiology	3
EXPW 4440 Physiology of Exercise.....	3
EXPW 4520 Adapted Physical Activity and Sport	3
EXPW 4730 Assessment & Evaluation in EXPW	3
EXPW 4810 Field Experience	3
EXPW 4900 Research Methods in Exercise Science	3
Electives.....	2
PHED 1002 Physical Fitness Test	0
Total	28

RECREATION AND LEISURE CONCENTRATION (RL)

(Leading to the Bachelor of Science Degree)

Freshman Year **sem.**
hrs.

BIOL 1010 Introduction to Biology.....	4
BIOL 1020 Diversity of Life	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
PSY 1030 Introduction to Psychology	3
EXPW 1021 Connection to Exercise Science	1

EXPW 1022 Introduction to Exercise Science.....	2
EXPW 2430 First Aid, Safety & CPR.....	2
Guided Elective	1
MATH 1010, 1130, 1410 or 1530	3
PHIL 1030; HIST 2210, 2220, 2310, 2320; THEA 1030 MUS 1030; ART 1035	3
PHED 1002 Physical Fitness Test.....	0
Total	32

Sophomore Year	sem. hrs.
BIOL 2350 Introductory Anatomy and Physiology	4
EXPW 2150 Human Sexuality	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Guided Elective	1
COMM 2025 or PC 2500.....	3
ENGL 2130, 2235 or 2330.....	3
SOC 1010; ECON 2010, 2020; GEOG 1012, 1130; POL 1030.....	3
PHED 1002 Physical Fitness Test.....	0
Total	32

Junior Year	sem. hrs.
EXPW 3070 Lifetime Wellness and Leisure Activities	3
EXPW 3410 Lifespan Motor Development	3
EXPW 3170 Motor Learning.....	3
EXPW 4420 Kinesiology.....	3
EXPW 4440 Physiology of Exercise.....	3
EXPW 4560 Facility Planning and Management.....	3
Guided Elective	3
Elective	3
PHED 1002 Physical Fitness Test.....	0
Total	30

Senior Year	sem. hrs.
EXPW 4730 Assessment & Evaluation in EXPW	3
Elective	3
Guided Elective	3
PHIL 1030; HIST 2210, 2220, 2310, 2320; THEA 1030 MUS 1030; ART 1035	3
PHED 1002 Physical Fitness Test.....	0
Total	26

Guided Election Options

PHED 1230 Map Reading/Orienteering
PHED 1520 Canoe Camping
PHED 1530 Backpacking Camping
PHED 1570 Bicycle Touring
PHED 1590 Back Country Adventure I
PHED 1600 Back Country Adventure II
PHED 1610 Challenge Course-Team Building Facilitation
PHED 1620 Boulderling Movement and Technique
PHED 1630 Basic Caving
PHED 1640 Mountain Bike Skills
PHED 1650 Outdoor Water Skills

SPORT ADMINISTRATION CONCENTRATION (SA)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
BIOL 1010 Introduction to Biology.....	4
BIOL 1020 Diversity of Life	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
EXPW 1021 Connection to Exercise Science	1
EXPW 1022 Introduction to Exercise Science	2
EXPW 1150 Care & Prevention of Athletic Injuries	3
HEC 1030 Introduction to Nutrition.....	2
MATH	3
PSY 1030 Introduction to Psychology	3
Electives.....	3
PHED 1002 Physical Fitness Test	0
Total	31

Sophomore Year	sem. hrs.
BIOL 2350 Introduction to Anatomy & Physiology.....	4
ECON 2010 Principles of Microeconomics	3
ENGL 2130, 2235, or 2330	3
EXPW 2160 Drug Use and Abuse	2
EXPW 2170 Introduction to Sport Administration.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Electives ²	6
COMM 2025 or PC 2500.....	3
PHED 1002 Physical Fitness Test	0
Total	30

Junior Year	sem. hrs.
ACCT 3720 Survey of Accounting.....	3
BMGT 3510 Management and Organizational Behavior.....	3
DS 2810 Computer Applications in Business.....	3
ECON 2020 Principles of Macroeconomics	3
EXPW 2430 First Aid, Safety and CPR.....	2
EXPW 3170 Motor Learning or Guided Elective	3
EXPW 3410 Lifespan Motor Development or Guided Elective.....	3
FIN 3210 Principles of Managerial Finance	3
HIST 4470-4479 Sport Studies	3
MKT 3400 Principles of Marketing	3
PHED 1002 Physical Fitness Test	0
Total	29

Senior Year	sem. hrs.
EXPW 4171 Exercise & Sport Psychology.....	3
EXPW 4420 Kinesiology or Guided Elective	3
EXPW 4440 Physiology of Exercise	3
EXPW 4520 Adapted Physical Activity and Sport or Guided Elective	3
EXPW 4530 Organization and Administration of Interscholar Athletics	3
EXPW 4540 Ethical Issues in Sport	3
EXPW 4550 Sport Governance.....	3
EXPW 4560 Facility Planning & Management.....	3
EXPW 4810 Field Experience	3
LAW 2810 Business Legal Environment and Ethics	3
PHED 1002 Physical Fitness Test.....	0
Total	30

¹ Select PHIL 1030, HIST 2310, HIST 2320, THEA 1030, MUS 1030, ART 1035, ENGL 2235, or ENGL 2330 as a Humanities/Fine Arts Elective.

Guided Electives

EXPW 4730 Assessment and Evaluation in Exercise Science
 EPW 4900 Research Methods in Exercise Science
 JOUR 2200 Mass Communication in a Changing Society
 JOUR 2220 News Reporting and Copy Editing
 JOUR 3400 Introduction to Broadcast Journalism

FINANCE (FIN)

(Leading to the Bachelor of Science in Business Administration Degree)

For courses in the freshman and sophomore years, see Basic Business (page 112).

Junior Year	sem. hrs.
FIN 3220 Intermediate Financial Management.....	3
FIN 3830 Fundamentals of Investment	3
BMGT 3510 Management & Organization Behavior	3
DS 3520 Operations Management	3
DS 3620 Business Analytics: Data Driven Decision Making.....	3
DS 3841 Management Information Systems	3
ECON 3320, 3810, or 3820	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance.....	3
LAW 2810 Business Legal Environment and Ethics.....	3
Total	30

Senior Year	sem. hrs.
BMGT 3720 Business Communication I.....	3
FIN 4230 Advanced Financial Decision Analysis.....	3
FIN 4910 or ECON 4510	3
FIN ELEC ¹	9
BMGT 4930 Business Strategy	3
MKT 3400 Principles of Marketing.....	3
Business Elective ¹	3

Elective ¹	3
Total	30

¹ Elective courses are to be selected in consultation with the academic advisor.

FOREIGN LANGUAGES (FL)

FRENCH, Option 1 (FLFR)

(Leading to the Bachelor of Arts Degree)

A major will consist of a minimum of 30 semester hours in French, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level, may substitute up to six semester hours in a second language or related field toward fulfillment of the major requirement. Linguistics 4500 Introduction to Language Description and Analysis is recommended for all Foreign Language majors and may, with approval of the departmental chairperson, be substituted for one Upper Division Course in French for students concentrating in French. It is particularly recommended for those French majors who are also working toward teacher licensure at the secondary school level.

The following courses, which require no foreign language background, may not be used as credit substitutes for required Upper Division Foreign Language courses: French 3510; German 3520 or 4510; Spanish 3510 or 3550. They may, however, serve as open electives in any curriculum or as credit substitutes for certain lower division Foreign Language courses.

Freshman Year	sem. hrs.
FREN 2010 Transition to Intermediate French ⁱ	3
FREN 2020 Intermediate French ⁱⁱ	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2210 or 2310.....	3
HIST 2220 or 2320.....	3
MATH	3
Natural Science.....	8
Humanities/Fine Arts Elective ²	3
UNIV 1020 First-Year Connections ¹	1
Total	32

Sophomore Year	sem. hrs.
FREN 3010 Written Communication in French ⁱⁱⁱ	3
FREN 3020 Oral Communication in French ^{3iv}	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Select two: ENGL 2130, 2235, or 2330.....	6
COMM 2025 Fundamentals of Communication	3
Social/Behavioral Sciences Electives.....	6
Elective	3
Total	30

Junior Year	sem. hrs.
FREN 3110 Survey of French Literature I	3
FREN 3112 Culture and Civilization of France.....	3
FREN 3120 Survey of French Literature II	3
HIST 4550 and any one of the following:	

HIST 4530, 4540, 4560, or 4570 or two course lower level sequence in another foreign language taught in the foreign language	6
Electives	16
Total	31

Senior Year	sem. hrs.
FREN 3100 French Phonetics	3
Select FREN 3200, 4810, or 4910	3
FREN 4920 Senior Capstone ⁴	3
Electives	18
Total	27

* Students are strongly encouraged to take six hours of study abroad courses.

¹ This course not included in 120-hour curriculum.

² ART 1035, GERM 2520, MUS 1030, SPAN 2510, SPAN 2550, THEA 1030 or PHIL 1030

³ This course is not open to students with native or near native fluency in French. Majors with native or near native fluency will substitute a different upper-level course for this one.

⁴ Students pursuing Teacher Licensure must take FREN 4925: Teaching Licensure Senior Capstone instead of FREN 4920: Senior Capstone.

ⁱ Foreign Language majors must pass FREN 2010 with a minimum of C or better in order to enroll in FREN 2020.

ⁱⁱ Foreign Language majors must pass FREN 2020 with a minimum of C or better in order to enroll in FREN 3010.

ⁱⁱⁱ Foreign Language majors must pass FREN 3010 with a minimum of C or better in order to enroll in subsequent upper-division French courses.

^{iv} Foreign Language majors must pass FREN 3020 with a minimum of C or better in order to enroll in subsequent upper-division French courses.

FRENCH, Option 2 (FLFR)

(Leading to the Bachelor of Arts Degree)

This option is only for students who concurrently earn a B.S. degree in Engineering, Industrial Technology, Computer Science, Mathematics, or the Physical or Biological Sciences.

Freshman Year	sem. hrs.
FREN 2010 Transition to Intermediate French ⁱ	3
FREN 2020 Intermediate French ⁱⁱ	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
HIST 2210 or HIST 2310 ²	3
HIST 2220 or HIST 2320 ²	3
MATH	3
Natural Science	8
UNIV 1020 First-Year Connections ¹	1
Total	29

Sophomore Year	sem. hrs.
FREN 3010 Written Communication in French ⁱⁱⁱ	3
FREN 3020 Oral Communication in French ^{3iv}	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Select two: ENGL 2130, 2235, or 2330 ²	6
COMM 2025 Fundamentals of Communication	3
Social/Behavioral Sciences Electives	6
Elective	3
Total	30

Junior Year	sem. hrs.
FREN 3110 Survey of French Literature I	3
FREN 3112 Culture and Civilization of France	3
FREN 3120 Survey of French Literature II	3
Electives	22
Total	31

Senior Year	sem. hrs.
FREN 3100 French Phonetics	3
Select FREN 3200, 4810, or 4910	3
FREN 4920 Senior Capstone	3
Electives	21
Total	30

* Students are strongly encouraged to take at least six hours in a study-abroad program.

¹ This course not included in 120-hour curriculum.

² For the humanities requirement in this option, students must take one English literature course and may use HIST 2210-2220 for six hours of humanities credit, or they may take two English literature courses and one from the following: ART 1035, GERM 2520, MUS 1030, SPAN 2510, SPAN 2550, THEA 1030 or PHIL 1030.

³ This course is not open to students with native or near native fluency in French. Majors with native or near native fluency will substitute a different upper-level course for this one.

ⁱ Foreign Language majors must pass FREN 2010 with a minimum of C or better in order to enroll in FREN 2020.

ⁱⁱ Foreign Language majors must pass FREN 2020 with a minimum of C or better in order to enroll in FREN 3010.

ⁱⁱⁱ Foreign Language majors must pass FREN 3010 with a minimum of C or better in order to enroll in subsequent upper-division French courses.

^{iv} Foreign Language majors must pass FREN 3020 with a minimum of C or better in order to enroll in subsequent upper-division French courses.

GERMAN, Option 1 (FLGE)

(Leading to the Bachelor of Arts Degree)

A major will consist of a minimum of 30 semester hours in German, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level may substitute up to six semester hours in a second language or related field toward fulfillment of the major requirement. Linguistics 4500 Introduction to Language Description and Analysis is recommended for all Foreign Language majors and

may, with approval of the departmental chairperson, be substituted for one Upper Division Course in German for students concentrating in German. It is particularly recommended for those German majors who are also working toward teacher licensure at the secondary school level.

The following courses, which require no foreign language background, may not be used as credit substitutes for required Upper Division Foreign Language courses: French 3510; German 3520 or 4510; Spanish 3510 or 3550. They may, however, serve as open electives in any curriculum or as credit substitutes for certain lower division Foreign Language courses.

Freshman Year	sem. hrs.
GERM 2010 Transition to Intermediate German ⁱ	3
GERM 2020 Intermediate German ⁱⁱ	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2210 or 2310.....	3
HIST 2220 or 2320.....	3
MATH.....	3
Natural Science.....	8
Humanities/Fine Arts Elective ²	3
UNIV 1020 First-Year Connections ¹	1
Total	32

Sophomore Year	sem. hrs.
GERM 3010 Written Communication in German ⁱⁱⁱ	3
GERM 3020 Oral Communication in German ^{iv}	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Any two from: ENGL 2130, 2235, or 2330.....	6
COMM 2025 Fundamentals of Communication.....	3
Social/Behavioral Science Electives.....	6
Electives.....	3
Total	30

Junior Year	sem. hrs.
GERM 3112 German Civilization and Culture.....	3
GERM 3150 Introduction to German Literature.....	3
HIST 4640 History of Modern Germany.....	3
Select one from GERM 3200, 4810, or 4910.....	3
Any one from the following: HIST 4530, 4540, 4550, 4560, or 4570.....	3
Electives.....	15
Total	30

Senior Year	sem. hrs.
Select two from GERM 3200, 4810, or 4910.....	6
GERM 4920 Senior Capstone ³	3
Electives.....	19
Total	28

* Students are strongly encouraged to take at least six hours in a study-abroad program.

¹ This course not included in 120-hour curriculum.

² ART 1035, FREN 2510, MUS 1030, SPAN 2510, SPAN 2550, THEA 1030 or PHIL 1030

³ Students pursuing Teacher Licensure must take GERM 4925: Teaching Licensure Senior

Capstone instead of GERM 4920: Senior Capstone.

- i Foreign Language majors must pass GERM 2010 with a minimum of C or better in order to enroll in GERM 2020.
- ii Foreign Language majors must pass GERM 2020 with a minimum of C or better in order to enroll in GERM 3010.
- iii Foreign Language majors must pass GERM 3010 with a minimum of C or better in order to enroll in subsequent upper-division German courses.
- iv Foreign Language majors must pass GERM 3020 with a minimum of C or better in order to enroll in subsequent upper-division German courses.

GERMAN, Option 2 (FLGE)

This option is only for students who concurrently earn a B.S. degree in Engineering, Industrial Technology, Computer Science, Mathematics, or the Physical or Biological Sciences.

Freshman Year	sem. hrs.
GERM 2010 Transition to Intermediate German ⁱ	3
GERM 2020 Intermediate German ⁱⁱ	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2210 or 2310 ²	3
HIST 2220 or 2320 ²	3
MATH.....	3
Natural Science.....	8
UNIV 1020 First-Year Connections ¹	1
Total	29

Sophomore Year	sem. hrs.
GERM 3010 Written Communication in German ⁱⁱⁱ	3
GERM 3020 Oral Communication in German ^{iv}	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Any two from: ENGL 2130, 2235, or 2330 ²	6
COMM 2025 Fundamentals of Communication.....	3
Social Behavioral Sciences Electives.....	6
Elective.....	3
Total	30

Junior Year	sem. hrs.
GERM 3112 German Civilization and Culture.....	3
GERM 3150 Introduction to German Literature.....	3
Select one from GERM 3200, 4810, or 4910.....	3
Electives.....	21
Total	30

Senior Year	sem. hrs.
Select two from GERM 3200, 4810, or 4910.....	6
GERM 4920 Senior Capstone.....	3
Electives.....	22
Total	31

* Students are strongly encouraged to take at least six hours in a study-abroad program.

¹ This course not included in 120-hour curriculum.

- ² For the humanities requirement in this option, students must take one English literature course and may use HIST 2210-2220 for six hours of humanities credit, or they may take two English literature courses and one from the following: ART 1035, FREN 2510, MUS 1030, SPAN 2510, SPAN 2550, THEA 1030 or PHIL 1030.
- i Foreign Language majors must pass GERM 2010 with a minimum of C or better in order to enroll in GERM 2020.
- ii Foreign Language majors must pass GERM 2020 with a minimum of C or better in order to enroll in GERM 3010.
- iii Foreign Language majors must pass GERM 3010 with a minimum of C or better in order to enroll in subsequent upper-division German courses.
- iv Foreign Language majors must pass GERM 3020 with a minimum of C or better in order to enroll in subsequent upper-division German courses.

SPANISH, Option 1 (FLSP)**(Leading to the Bachelor of Arts Degree)**

A major will consist of a minimum of 30 semester hours in Spanish, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level may substitute up to six semester hours in a second language or related field toward fulfillment of the major requirement. Linguistics 4500 Introduction to Language Description and Analysis is recommended for all Foreign Language majors and may, with approval of the departmental chairperson, be substituted for one Upper Division Course in Spanish for students concentrating in Spanish. It is particularly recommended for those Spanish majors who are also working toward teacher licensure at the secondary school level.

The following courses, which require no foreign language background, may not be used as credit substitutes for required Upper Division Foreign Language courses; French 3510; German 3520 or 4510; Spanish 3510 or 3550. They may, however, serve as open electives in any curriculum or as credit substitutes for certain lower division Foreign Language courses.

Freshman Year	sem. hrs.
SPAN 2010 Transition to Intermediate Spanish ⁱ	3
SPAN 2020 Intermediate Spanish ⁱⁱ	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2210 or 2310.....	3
HIST 2220 or 2320.....	3
MATH.....	3
Natural Science.....	8
Humanities/Fine Arts Elective ²	3
UNIV 1020 First-Year Connections ¹	1
Total	32

Sophomore Year	sem. hrs.
SPAN 3010 Written Communication in Spanish ⁱⁱⁱ	3
SPAN 3020 Oral Communication in Spanish ^{3iv}	3
HIST 2010 Early United States History.....	3

HIST 2020 Modern United States History.....	3
Any two from: ENGL 2130, 2235, or 2330.....	6
COMM 2025 Fundamentals of Communication.....	3
Social/Behavioral Sciences Electives.....	6
Elective.....	3
Total	30

Junior Year	sem. hrs.
SPAN 3200, 4030, 4810, 4910 or 4010, 4020, 4110, 4120 (if not already taken).....	6
SPAN 4010 or 4020.....	3
SPAN 4110 or 4120.....	3
HIST 3710, 4790-4799, or two course lower level sequence in another foreign language taught in the foreign language.....	6
Electives.....	15
Total	33

Senior Year	sem. hrs.
Any course not already taken from the following: SPAN 3200, 4010, 4020, 4030, 4110, 4120, 4810, or 4910.....	3
SPAN 4920 Senior Capstone ⁴	3
Electives.....	19
Total	25

- * Students are strongly encouraged to take at least six hours in a study-abroad program.
- ¹ This course not included in 120-hour curriculum.
- ² ART 1035, FREN 2510, GERM 2520, MUS 1030, THEA 1030 or PHIL 1030
- ³ This course is not open to students with native or native fluency in Spanish. Majors with native or near native fluency in Spanish will substitute a different upper level course for this one.
- ⁴ Students pursuing Teacher Licensure must take SPAN 4925: Teaching Licensure Senior Capstone instead of SPAN 4920: Senior Capstone.
- i Foreign Language majors must pass SPAN 2010 with a minimum of C or better in order to enroll in SPAN 2020.
- ii Foreign Language majors must pass SPAN 2020 with a minimum of C or better in order to enroll in SPAN 3010.
- iii Foreign Language majors must pass SPAN 3010 with a minimum of C or better in order to enroll in subsequent upper-division Spanish courses.
- iv Foreign Language majors must pass SPAN 3020 with a minimum of C or better in order to enroll in subsequent upper-division Spanish courses.

SPANISH, Option 2 (FLSP)

This option is only for students who concurrently earn a B.S. degree in Engineering, Industrial Technology, Computer Science, Mathematics, or the Physical or Biological Sciences.

Freshman Year	sem. hrs.
SPAN 2010 Transition to Intermediate Spanish ⁱ	3
SPAN 2020 Intermediate Spanish ⁱⁱ	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2210 or 2310 ²	3

HIST 2220 or 2320 ²	3
MATH	3
Natural Science	8
UNIV 1020 First-Year Connections ¹	1
Total	29

Sophomore Year

sem.
hrs.

SPAN 3010 Written Communication in Spanish ⁱⁱⁱ	3
SPAN 3020 Oral Communication in Spanish ^{iv}	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Any two from: ENGL 2130, 2235, or 2330 ²	6
COMM 2025 Fundamentals of Communication.....	3
Social/Behavioral Sciences Electives	6
Electives	3
Total	30

Junior Year

sem.
hrs.

SPAN 3200, 4030, 4810, or 4910.....	6
SPAN 4010 or 4020	3
SPAN 4110 or 4120	3
Electives	18
Total	30

Senior Year

sem.
hrs.

Any course not already taken from the following SPAN 3200, 4010, 4020, 4110 or 4120	3
SPAN 4920 Senior Capstone	3
Electives	25
Total	31

* Students are strongly encouraged to take at least six hours in a study-abroad program.

¹ This course not included in 120-hour curriculum.

² For the humanities requirement in this option, students must take one English literature course and may use HIST 2210-2220 for six hours of humanities credit, or they may take two English literature courses and one from the following: ART 1035, FREN 2510, GERM 2520, MUS 1030, THEA 1030 or PHIL 1030.

³ This course is not open to students with native or native fluency in Spanish. Majors with native or near native fluency in Spanish will substitute a different upper level course for this one.

ⁱ Foreign Language majors must pass SPAN 2010 with a minimum of C or better in order to enroll in SPAN 2020.

ⁱⁱ Foreign Language majors must pass SPAN 2020 with a minimum of C or better in order to enroll in SPAN 3010.

ⁱⁱⁱ Foreign Language majors must pass SPAN 3010 with a minimum of C or better in order to enroll in subsequent upper-division Spanish courses.

^{iv} Foreign Language majors must pass SPAN 3020 with a minimum of C or better in order to enroll in subsequent upper-division Spanish courses.

GEOSCIENCES (GEOS)

ENVIRONMENTAL GEOLOGY CONCENTRATION (EGEO)

(Leading to the Bachelor of Science Degree)

Freshman Year

sem.
hrs.

GEOL 1020 Field Experiences in the Geosciences ¹ ..	1
GEOL 1040 Physical Geology.....	4
GEOL 1045 Earth Environment, Resources & Society	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH ²	3-5
Total	31-33

Sophomore Year

sem.
hrs.

GEOL 2500 Geologic Fundamentals	3
Required Course from Environmental Geology Concentration	3-4
PHYS 2010, 2020 or BIOL 1020, 3130	8
MATH 3070 Statistical Methods I.....	3
Humanities/Fine Arts Electives.....	6
ENGL 2130, 2235, or 2330	3
GEOG 4510 Theory of GIS I.....	3
Total	29-30

Junior Year

sem.
hrs.

Social/Behavioral Sciences Electives.....	6
COMM 2025 Fundamentals of Communication	3
Required Courses from EGEO Concentration	9-12
Directed Electives from EGEO Concentration.....	6-8
MATH or Free Elective ³	3
Total	27-32

Senior Year

sem.
hrs.

GEOL 4930 Senior Thesis	3
GEOL 4931 Senior Thesis	3
Required Course from EGEO Concentration	6-8
Directed Electives from EGEO Concentration.....	3-4
Free Electives	4-15
MATH or Free Elective ³	3
Total	25-33

¹ This course not included in 120-hour curriculum.

² MATH 1130, 1730 or 1910

³ If MATH 1130 was taken, then take MATH 1720; otherwise take a free elective.

Required Environmental Geology Concentration Courses (21 hours)

GEOL 3200	Water Resources	3
GEOL 4150	Geomorphology	4
GEOL 4200	Geological Exploration Techniques	4
GEOL 4410	Remote Sensing	3
GEOL 4711	Hydrogeology	4
GEOG 4650	Environmental Applications of GIS	3

Environmental Concentration Directed Electives, any three of the following nine courses, (9-11 hours)

AGRN 4220	Environmental Soil Chemistry	3
AGRN 4230	Soil Classification	3
BIOL 2310	General Botany	4
BIOL 4610	Invertebrate Zoology	3
BIOL 4840	Limnology	3
GEOG 1100	Global Climate Change	3
GEOG 2100	Introduction to Meteorology	4
GEOL 2000	Earth Evolution and Life History	3
WFS 4500	National Wildlife Policy	3

GEOGRAPHIC INFORMATION SYSTEMS CONCENTRATION (GIS)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem.
	hrs.
GEOL 1020 Field Experiences in the Geosciences ¹ ..1	
GEOL 1040 Physical Geology.....4	
GEOL 1045 Earth Environment, Resources & Society.....4	
ENGL 1010 English Composition I.....3	
ENGL 1020 English Composition II.....3	
CHEM 1110 General Chemistry I.....4	
CHEM 1120 General Chemistry II.....4	
HIST 2010 Early United States History.....3	
HIST 2020 Modern United States History.....3	
MATH ²3-5	
Total	31-33

Sophomore Year	sem.
	hrs.
CSC 1300 or WEBD 1500.....3	
GEOL 2500 Geological Fundamentals3	
PHYS 2010, 2020 or BIOL 1020, 31308	
MATH 3070 Statistical Methods I.....3	
Humanities/Fine Arts Electives.....6	
ENGL 2130, 2235, or 2330.....3	
GEOG 4510 Theory of GIS I.....3	
Total	29

Junior Year	sem.
	hrs.
Social/Behavioral Sciences Electives.....6	
COMM 2025 Fundamentals of Communication.....3	
Required Courses from GIS Concentration.....15	
Directed Electives from GIS Concentration.....6-8	
Total	30-32

Senior Year	sem.
	hrs.
GEOL 4930 Senior Thesis.....3	
GEOL 4931 Senior Thesis.....3	
Directed Electives from GIS Concentration.....3-4	
MATH or Free Elective ³3	
Free Electives.....12-17	
Total	25-29

¹ This course not included in 120-hour curriculum.² MATH 1130, 1730 or 1910³ If MATH 1130 was taken, then take MATH 1720; otherwise take a free elective.**Geographic Information Systems (GIS) Concentration Required Courses (15 hours)**

WEBD 1500	Introduction to Web Design	3
GEOG 4210	Cartography	3
GEOL 4410	Remote Sensing	3
GEOG 4650	Environmental Applications of GIS	3
GEOG 4850	Advanced GIS	3

Geographic Information Systems (GIS) Concentration Directed Electives, any three of the following seven courses (9-10 hours)

GEOG 1035	World Regional Geography I	3
GEOG 1100	Global Climate Change	
GEOG 2100	Introduction to Meteorology	4
GEOG (GEOL) 3200	Water Resources	3
MATH 3080 or PSY 3010		3
GEOG 3010	Geography of the U.S.	3
GEOG (GEOL) 4150	Geomorphology	4
GEOG 4511	Theory of GIS II	3
GEOG (GEOL) 4711	Hydrogeology	4

GEOGRAPHY CONCENTRATION (GEOG)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem.
	hrs.
GEOL 1020 Field Experiences in the Geosciences ¹ ..1	
GEOL 1040 Physical Geology.....4	
GEOL 1045 Earth Environment, Resources & Society.....4	
ENGL 1010 English Composition I.....3	
ENGL 1020 English Composition II.....3	
CHEM 1110 General Chemistry I.....4	
CHEM 1120 General Chemistry II.....4	
HIST 2010 Early United States History3	
HIST 2020 Modern United States History3	
MATH ²3-5	
Total	31-33

Sophomore Year	sem.
	hrs.
GEOL 2500 Geologic Fundamentals3	
Two Required Course from Geography Concentration.....6-7	
PHYS 2010, 2020 or BIOL 1020, 31308	
MATH 3070 Statistical Methods I.....3	
Humanities/Fine Arts Electives.....6	
ENGL 2130, 2235, or 23303	
GEOG 4510 Theory of GIS I.....3	
Total	32-33

Junior Year	sem. hrs.
COMM 2025 Fundamentals of Communication.....	3
Required Courses from Geography	
Concentration.....	9-10
Directed Electives from Geography Concentration. 3-4	
MATH or Free Elective ³	3
Free Electives.....	6
Total	24-26

Senior Year	sem. hrs.
GEOG 4930 Senior Thesis.....	3
GEOG 4931 Senior Thesis.....	3
Required Courses from Geography	
Concentration.....	3-4
Three Directed Electives from Geography	
Concentration.....	10-11
Free Electives.....	8-14
Total	28-33

¹ This course not included in 120-hour curriculum.

² MATH 1130, 1730 or 1910

³ If MATH 1130 was taken, then take MATH 1720; otherwise take a free elective.

Geography Concentration Required Courses (19 hours)

GEOG 1012	Cultural Geography	3
GEOG 1130	Geography of Natural Hazards	3
GEOG 2100	Introduction to Meteorology	4
GEOG 3200	Water Resources	3
GEOG 4210	Cartography	3
GEOG 4650	Environmental Applications of GIS	3

Geography Concentration Directed Electives, any four of the following courses (12-14)

GEOG 1035	World Regional Geography I	3
GEOG 1100	Global Climate Change	3
GEOL 2000	Earth Evolution and Life History	3
GEOG 2010	World Regional Geography (TN eCampus)	3
GEOG 3710	Geography of the U.S. (TN eCampus)	3
GEOG 4150	Geomorphology	4
GEOG 4410	Remote Sensing	3
GEOG 4511	Theory of GIS II	3
GEOG 4711	Hydrogeology	4
GEOG 4850	Advanced GIS	3

GEOLOGY CONCENTRATION (GEO)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
GEOL 1020 Field Experiences in the Geosciences ¹ ..	1
GEOL 1040 Physical Geology.....	4
GEOL 1045 Earth Environment, Resources & Society	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3

CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH ²	3-5
Total	31-33

Sophomore Year	sem. hrs.
GEOL 2500 Geologic Fundamentals	3
One Required Course from Geology	
Concentration.....	3-4
PHYS 2010, 2020 or BIOL 1020, 3130	8
MATH 3070 Statistical Methods I.....	3
Humanities/Fine Arts Electives.....	6
ENGL 2130, 2235, or 2330	3
GEOG 4510 Theory of GIS I.....	3
Total	29-30

Junior Year	sem. hrs.
Social/Behavioral Sciences Electives.....	6
COMM 2025 Fundamentals of Communication	3
Required Courses from Geology	
Concentration.....	11-12
Directed Electives from Geology	
Concentration.....	7-8
MATH or Free Elective ³	3
Total	30-32

Senior Year	sem. hrs.
GEOL 4930 Senior Thesis	3
GEOL 4931 Senior Thesis	3
Directed Electives from Geology Concentration.....	3-4
Free Electives	17-22
Total	26-32

¹ This course not included in 120-hour curriculum.

² MATH 1130, 1730 or 1910

³ If MATH 1130 was taken, then take MATH 1720; otherwise take a free elective.

Geology Concentration Required Courses (15-16 hours)

GEOL 2000	Earth Evolution and Life History	3
GEOL 3110	Principles of Mineralogy and Petrology	4
GEOL 3230	Structural Geology & Tectonics	4
GEOL 3830	Field Geology	4
GEOL 4110	Sedimentation and Stratigraphy	4

Geology Concentration Directed Electives any three of the following courses (9-12 hours)

GEOL 1100	Global Climate Change	3
GEOL 3120	Mineralogy	4
GEOL 3350	Paleobiology	3
GEOL 3410	Paleontology	4
GEOL 4150	Geomorphology	4
GEOL 4200	Geological Exploration Techniques	4
GEOL 4210	Advanced Historical	3

GEOL 4610	Geology Optical Mineralogy and Petrography	4
GEOL 4711	Hydrogeology	4

HISTORY (HIBA)**(Leading to the Bachelor of Arts Degree)**

Freshman Year	sem. hrs.
HIST 2210 or 2310	3
HIST 2220 or 2320	3
HIST 3410 Introduction of Historical Methods	3
MATH	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Social/Behavioral Sciences Electives	6
Foreign Language ⁴	6
Total	30

Sophomore Year	sem. hrs.
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Electives	6
ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500	3
Foreign Language ⁴	6
Natural Science	8
Total	32

Junior Year	sem. hrs.
American History (Upper Division) ¹	3
European History (Upper Division) ²	3
World History (Upper Division) ³	3
ENGL, JOUR, LING, SPCH, THEA or WEBD (Upper Division)	3
CJ, POLS, SOC, SW, PHIL, RELS or PSY (Upper Division)	3
Foreign Language ⁴	6
Electives or Minor	9
Total	30

Senior Year	sem. hrs.
HIST 4990-4999 Senior Seminar	3
HIST (Upper Division)	9
Electives or Minor	16
Total	28

¹ American History Upper Division include 3100, 3360, 3900, 4010-4310, 4340-4390, 4440-4449.

² European History Upper Division include 3550, 3560, 3710, 4510-4690.

³ World History Upper Division include 4440-4449, 4620, 4710-4790, 4880.

⁴ Foreign Language for the B.A. degree:
Proficiency level in one language to include both (1) and (2) below:
(1) Proficiency through the 2020 level in one language and (2) Six semester hours of upper division courses in the same language.

HISTORY (HIBS)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
HIST 2210 or 2310	3
HIST 2220 or 2320	3
HIST 3410 Introduction of Historical Methods	3
MATH	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Natural Science ⁷	8
Elective	3
Total	29

Sophomore Year	sem. hrs.
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Electives	6
ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500	3
Foreign Language, any course (2-3 credits) ¹	2-3
Foreign Language 1020 (3 credits) ²	3
Social/Behavioral Sciences Electives	6
Elective or Minor	3
Total	33

Junior Year	sem. hrs.
American History (Upper Division) ³	3
European History (Upper Division) ⁴	3
World History (Upper Division) ⁵	3
CJ, POLS, SOC, SW, PHIL, RELS or PSY (Upper Division)	3
ENGL, JOUR, LING, SPCH, THEA, or WEBD (Upper Division)	3
Natural Science ⁷	7
Minor	6
Foreign Language any course	2-3 ⁶
Total	30

Senior Year	sem. hrs.
HIST 4990-4999 Senior Seminar	3
HIST (Upper Division)	9
Electives	10
Minor (Upper Division)	6
Total	28

¹ MATH 1910 may substitute for this requirement.

² MATH 1920 may substitute for this requirement.

³ American History Upper Division include: 3100, 3360, 3900, 4010-4310, 4340-4390, 4440-4449.

⁴ European History Upper Division include: 3550, 3560, 3710, 4510-4690.

⁵ World History Upper Division include: 4440-4449, 4620, 4710-4790.

⁶ MATH 2110 may substitute for this requirement.

⁷ Fifteen credit hours of science with at least eight credit hours completed in the same discipline. HIST 3900, HIST 4290, HIST 4810

or MATH 4610 may substitute for three of the 15 total credit hours.

HUMAN ECOLOGY (HEC)

CHILD DEVELOPMENT AND FAMILY RELATIONS (CDFR)

(Leading to the Bachelor of Science Degree, Non-Licensure)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ART 1035 or MUS 1030	3
Natural Science ¹	8
SOC 1010 Introduction to Sociology	3
HEC 1005 Introduction to Human Ecology	1
HEC 1010 Life Span Development	3
HEC 1020 Social and Professional Etiquette	1
HEC 1030 Introduction to Nutrition	2
AGHE 1020 Connections in Agriculture and Human Ecology	1
Total	27

Sophomore Year	sem. hrs.
AGHE 2022 Professionalism in Agriculture and Human Ecology	1
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH	3
PSY 1030 Introduction to Psychology	3
CFS 2400 Children with Special Needs	3
HEC 2065 Families in Society	3
HEC 2510 Creative Play	3
COMM 2025 or PC 2500	3
Total	31

Junior Year	sem. hrs.
AGHE 3000, 3200 or 3275	3
Humanities/Fine Arts Elective	3
EXPW 2150 Human Sexuality	3
HEC 3011 Consumer Economics	3
HEC 3066 Family Violence across the Lifespan	3
HEC 3100 Intercultural Competence	3
HEC 3290 Nutrition through the Life Cycle	3
HEC 3500 Development: Middle Childhood/Adolescence	3
HEC 3520 Parent Education and Child Guidance	2
HEC 3565 Loss and Bereavement for Children and Families	3
HEC 3700 Development: Young Adulthood/Aging	3
HEC 4065 Social Policy for Children and Families	3
Total	35

Senior Year	sem. hrs.
AGHE 4500 Senior Seminar	1
ECSP 4300 Assessment of Young Children	3
HEC 3660 Interpersonal Relationships	3
HEC 4065 Social Policy for Children and Families	3
HEC 4600 Theories in Family Development & Relationships	3
HEC 4610 Families: Normative/Catastrophic Issues	3

HEC 4630 Family Life Education	3
HEC 4910 Internship in Child Development and Family Relations	6
Upper Division Electives	3
Electives ³	6
Total	29

- 1 Select 8 hours of TTU General Education approved Natural Science courses.
- 2 The School of Human Ecology, Child Development and Family Relations (CDFR) concentration has met the standards and criteria required for the Provisional Certified Family Life Educator (CFLE) designation from the National Council on Family Relations (NCFR). Beginning in Fall 2016, students who graduate from the School of Human Ecology CDFR curriculum (and have met all CFLE course requirements) now qualify to complete an abbreviated CFLE application process. This program approval does not imply accreditation, but recognizes the inclusion of relevant course work for each of the ten family life content areas needed for the Provisional Certified Family Life Educator designation.
- 3 AGHE 1020 not required for transfer students with more than 12 hours.

CHILD LIFE CONCENTRATION (HECL)

(Leading to the Bachelor of Science Degree, Non-Licensure)

The Child Life program, a gateway to the Certified Child Life Specialist (CCLS) credential, is coordinated with the Association of Child Life Professionals programmatic and educational standards for the child life practitioner.

Application to the Child Life program at Tennessee Technological University is required and should be made in the second semester of sophomore year after completing HEC 2250 and while enrolled in HEC 2550.

The components of eligibility to sit for the Child Life Professional Certification Examination are:

1. Baccalaureate degree
2. Complete 10 college courses in specific content areas
 - Including child life content taught by a Certified Child Life Specialist
3. Child Life Clinical Internship (600 hours under the direct supervision of a Certified Child Life Specialist)

For more details regarding eligibility requirements, please see the Association of Child Life Professional's website at childlife.org

Freshman Year	sem. hrs.
COMM 2025 or PC 2500	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
HEC 1005 Introduction to Human Ecology	1
HEC 1010 Life Span Development	3
HEC Core	3
HIST 2010 Early United States History	3
Humanities/Fine Arts Elective	3
MATH 1530 Introductory Statistics	3
SOC 1010 Introduction to Sociology	3
ART 1035 or MUS 1030	3
AGHE 1020 Connections in Agriculture and	

Human Ecology.....	1
Total	29

Sophomore Year

sem.
hrs.

AGHE 2022 Professionalism in Agriculture and Human Ecology	1
BIOL 2010 Human Anatomy and Physiology I	4
BIOL 2020 Human Anatomy and Physiology II	4
CFS 2400 Children with Special Needs	3
HIST 2020 Modern United States History.....	3
HEC 2020 Nutrition for Health Sciences.....	3
HEC 2065 Families in Society	3
HEC 2200 Development of Young Children: Conception to Age 6.....	3
HEC 2220 Medical Terminology of the Human Sciences.....	1
HEC 2250 Child Life: Theory and Practice	3
HEC 2550 Children in Health Care.....	3
Total	31

Junior Year

sem.
hrs.

AGHE 3275 Research in Agriculture and Human Ecology	3
BIOL 3700 Humanism in Medicine	3
ENGL 2130, 2235, or 2330.....	3
HEC 2510 Creative Play.....	3
HEC 3500 Development: Middle Childhood/Adolescence.....	3
HEC 3520 Parent Education and Child Guidance.....	2
HEC 3550 Child Life Assessment of Children and Families.....	3
HEC 3560 Child Life Intervention Strategies	3
HEC 3565 Loss and Bereavement for Children and Families.....	3
HEC 3570 Child Life Practicum	1
HEC 3591 Introduction to Child Life Clinical Experience	2
HEC 3700 Development: Young Adulthood/Aging	3
NURS 3050 Pediatric Illness and Related Care	1
PSY 1030 Introduction to Psychology	3
Total	35

Senior Year

sem.
hrs.

AGHE 4500 Senior Seminar.....	1
HEC 3011 Consumer Economics.....	3
HEC 4600 Theories in Family Development & Relationships.....	3
HEC 4610 Families: Normative/Catastrophic Issues.....	3
HEC 4550 Research Methods and Professional Aspects of Child Life.....	3
HEC 4590 Clinical Child Life Experience.....	12
Total	25

In order to graduate with a B.S. degree, Human Ecology, concentration Child Life, the following requirements must be completed prior to graduation.

1. Students must be accepted into and successfully complete a child life practicum under the direct supervision of a Certified Child Life Specialist. The Child Life practicum course may be taken in the Spring or Summer semester of the Junior year.
2. Student must be accepted into and successfully complete a Child Life clinical experience (internship) which is supervised by a Certified Child Life Specialist. To pass

the clinical experience course, students must earn minimal entry-level competence during the internship experience.

3. Students who are unsuccessful in securing placement for an appropriate practicum may not continue on in the Child Life concentration. Students who are unsuccessful in securing an appropriate Child Life Internship prior to graduation, may NOT graduate with a degree in Human Ecology, concentration in Child Life.
4. AGHE 1020 not required for transfer students with more than 12 hours.

FAMILY & CONSUMER SCIENCES EDUCATION (HEED)

(Leading to the Bachelor of Science in Human Ecology Degree)

Freshman Year

sem.
hrs.

ART 1035 Art Appreciation	3
CHEM 1010 Introductory Chemistry I.....	4
CHEM 1020 Introductory Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2010 Early United States History	3
MATH 1010 Math for General Studies	3
AGHE 2022 Professionalism in Agriculture and Human Ecology	1
HEC 1005 Introduction to Human Ecology.....	1
HEC 1010 Life Span Development	3
HEC 2020 Nutrition for Health Sciences	3
AGHE 1020 Connections in Agriculture and Human Ecology ⁵	1
Total	32

Sophomore Year

sem.
hrs.

ENGL 2130, 2235, or 2330	3
HIST 2020 Modern United States History	3
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Electives.....	6
COMM 2025 or PC 2500.....	3
EDPY 2210 Educational Psychology	3
HEC 2065 Families in Society.....	3
HEC 2200 Development of Young Children: Conception to Age 6	3
HEC 2355 Clothing Construction	3
HEC 2800 Introduction to Teaching Family & Consumer Sciences.....	3
HEC 3290 Nutrition through the Life Cycle	3
Total	36

Junior Year³

sem.
hrs.

AGHE 4500 Senior Seminar	1
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
HEC 2240 Food Preparation & Management.....	4
HEC 2421 Architectural Graphics and Presentation Techniques	3
HEC 3011 Consumer Economics.....	3
HEC 3500 Development: Middle Childhood/Adolescence	3
HEC 3520 Parent Education & Child Guidance	2
HEC 3805 Materials & Methods of Teaching Family & Consumer Sciences Education	3
HEC 3812 Practicum: Family & Consumer Sciences	

Education	2
HEC 4005 Senior Seminar in Human Ecology	2
READ 3350 Teaching Reading in the Content Areas	3
Total	27

Senior Year⁴ sem. hrs.

HEC 4871 Residency I	5
HEC 4872 Professional Seminar I	5
HEC 4881 Residency II	10
HEC 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities In the Regular Classroom.....	3
Total	25

¹ Student working toward teacher certification must take HEC 4871, HEC 4872, HEC 4881, and HEC 4882 and must complete all requirements for admission to Teacher Education Program. Students seeking non-licensure HEED must take 22 credit hours including: AGHE 4500 (1 credit), HEC 4990 (12 hours) and a total of eight credit hours of electives, three hours of which must be upper division credits, to total 22 credits.

² As a sophomore, complete paperwork for admission to Teacher Education Program, and take Praxis I exam or apply for exemption.

³ As a junior, complete Benchmarks and paperwork for Residency I requirements; take Praxis II exam and FACS content; and apply for graduation.

⁴ Apply for Admission for Residency II.

⁵ AGHE 1020 not required for transfer students with more than 12 hours.

FOOD SYSTEMS ADMINISTRATION (HEFA)

(Leading to the Bachelor of Science in Human Ecology Degree)

Freshman Year sem. hrs.

CHEM 1010 Introductory Chemistry I	4
CHEM 1020 Introductory Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
HEC 1005 Introduction to Human Ecology	1
HEC 1010 Life Span Development.....	3
HEC 2065 Families in Society	3
HIST 2010 Early United States History.....	3
MATH 1130 College Algebra.....	3
COMM 2025 Fundamentals of Communication.....	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	31

Sophomore Year sem. hrs.

AGHE 2022 Professionalism in Agriculture and Human Ecology	1
BIOL 1010 Introduction to Biology I.....	4
BIOL 1020 or CHEM 3005	4
ENGL 2130, 2235, or 2330	3
HEC 2020 Nutrition for Health Sciences	3
HEC 2240 Food Preparation & Management.....	4
Humanities/Fine Arts Electives ¹	6
MATH 1530 Introductory Statistics.....	3
SOC 1010 or 1100	3
Total	31

Junior Year sem. hrs.

BIOL 2350 Introductory Anatomy and Physiology.....	4
BIOL 3230 Health Sciences Microbiology	4
HEC 3011 Consumer Economics.....	3
HEC 3240 Quantity Food Production	4
HEC 3270 Nutrition in Disease.....	3
HIST 2020 Modern United States History	3
PSY 1030 Introduction to Psychology	3
ACCT 2110 Principles of Accounting I	3
ECON 2010 Principles of Microeconomics	3
Total	30

Senior Year sem. hrs.

AGHE 3000, 3200 or 3275	3
AGHE 4500 Senior Seminar	1
BMGT 3510 Management & Organization Behavior ..	3
BMGT 3630 Human Resource Management	3
HEC 3290 or 3201	3
HEC 4242 Food Systems Administration	3
HEC 4940 Nutrition, Fitness & Wellness.....	2
HEC 4254 or 4995	6
MKT 3310 or 3400	3
Total	28

- To be eligible to complete endorsement to become a School Nutrition Supervisor in Tennessee, the following courses must be taken:
 - Take HEC 4252 instead of HEC 4995.
 - Enroll in 18 total credits of Education, Psychology or Sociology-See advisor for suggested courses.
 - Successfully complete BMGT 3630, ACCT 2110, HEC 4242, HEC 2020 and MATH 1530.
- To be eligible to apply for Environmental Health Specialist in Tennessee, twenty-four (24) credits in natural sciences are required. See advisor for suggested courses.
- This curriculum DOES NOT meet accreditation content requirements to complete the Didactic Program in Dietetics (DPD); therefore students in the Food Systems Administration curriculum are NOT eligible to complete requirements to become a Registered Dietitian/Nutritionist (RDN).
- AGHE 1020 not required for transfer students with more than 12 hours.

HOUSING AND DESIGN (HEHO)**(Leading to the Bachelor of Science in Human Ecology Degree)**

Freshman Year	sem. hrs.
HEC 1005 Introduction to Human Ecology.....	1
HEC 2041 Aspects of Housing & Furnishings.....	3
ART 1035 Art Appreciation.....	3
CHEM 1010 Introductory Chemistry I.....	4
CHEM 1020 Introductory Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1010 or 1530.....	3
MATH 1130 College Algebra.....	3
SOC 1010 or 1100.....	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	31

Sophomore Year	sem. hrs.
AGHE 2022 Professionalism in Agriculture and Human Ecology.....	1
DS 2810 Computer Applications in Business.....	3
HEC 1010 Life Span Development.....	3
HEC 2065 Families in Society.....	3
HEC 2320 Analysis of Apparel and Furnishings.....	3
HEC 2411 Practicum: Housing & Design.....	1
HEC 2421 Architectural Graphics & Presentation Techniques.....	3
HEC 2440 Computer Aided Design of Residence.....	3
ENGL 2130, 2235, or 2330.....	3
PSY 1030 Introduction to Psychology.....	3
COMM 2025 or PC 2500.....	3
Total	29

Junior Year	sem. hrs.
AGHE 3000, 3200 or 3275.....	3
HEC 2431 Residential Design I.....	3
HEC 2460 Interior Architecture Codes and Standards.....	2
HEC 3310 Textiles I.....	3
HEC 3320 Textiles II.....	3
HEC 3350 Merchandising I.....	3
HEC 3431 Residential Design II.....	3
ECON 2010 Principles of Microeconomics.....	3
ECON 2020 Principles of Macroeconomics.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Total	32

Senior Year	sem. hrs.
AGHE 4500 Senior Seminar.....	1
HEC 3011 Consumer Economics.....	3
HEC 4450 Commercial Design.....	3
HEC 4460 Historical and Contemporary Architecture And Furnishings.....	3
HEC Upper Division Elective.....	6
Humanities/Fine Arts Elective.....	3
FIN 3410 Principles of Real Estate.....	3
MKT 3400 Principles of Marketing.....	3
Elective.....	3
Total	28

- ¹ AGHE 1020 not required for transfer students with more than 12 hours.
- ² Transfer students must take at least CHEM 1010 as a prerequisite for Textiles I.

MERCHANDISING AND DESIGN (HEME)**(Leading to the Bachelor of Science in Human Ecology Degree)**

Freshman Year	sem. hrs.
HEC 1005 Introduction to Human Ecology.....	1
HEC 1010 Life Span Development.....	3
CHEM 1010 Introductory Chemistry I.....	4
CHEM 1020 Introductory Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HEC 1100 Design Concepts of Dress.....	2
HEC 1150 Analysis of Apparel and Findings.....	3
MATH 1010 Math for General Studies.....	3
SOC 1010 or ANTH 1100.....	3
AGHE 1020 Connections in Agriculture and Human Ecology.....	1
Total	31

Sophomore Year	sem. hrs.
AGHE 2022 Professionalism in Agriculture and Human Ecology.....	1
ENGL 2130, 2235, or 2330.....	3
ECON 2010 Principles of Microeconomics.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH 1530 Introductory Statistics.....	3
PSY 1030 Introduction to Psychology.....	3
HEC 2065 Families in Society.....	3
HEC 2311 Practicum: Merchandising & Design.....	1
HEC 2355 Clothing Construction.....	3
COMM 2025 or PC 2500.....	3
Total	32

Junior Year	sem. hrs.
ACCT 3720 Survey of Accounting.....	3
Apparel Course ³	6
AGHE 3000, 3200, 3275.....	3
HEC 3011 Consumer Economics.....	3
HEC 3310 Textiles I.....	3
HEC 3320 Textiles II.....	3
HEC 3350 Merchandising I.....	3
MKT 3400 Principles of Marketing.....	3
Electives.....	2
Total	29

Senior Year	sem. hrs.
Humanities/Fine Arts Electives.....	6
HEC 4315 Global Social Responsibility.....	3
HEC 4320 Merchandise Promotion & Advertising.....	3
HEC 4340 History of Dress.....	3
HEC 4360 Merchandising II.....	3
HEC 4990 Internship.....	6
Upper Division Business Elective.....	3
Total	26

- ¹ AGHE 1020 not required for transfer students with more than 12 hours.
- ² To progress into Textiles I, a minimum grade of "C" is required in CHEM 1010 and CHEM 1020 and these must courses must be taken before the junior year.
- ³ Select two: HEC 2300, 3300, 4300, 4301 (offered in Odd Years).

NUTRITION AND DIETETICS¹ (HDPD)**(Leading to the Bachelor of Science in Human Ecology Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1010 Introductory Chemistry I	4
CHEM 1020 Introductory Chemistry II	4
HEC 1005 Introduction to Human Ecology	1
HEC 1010 Life Span Development	3
HEC 2065 Families in Society	3
HIST 2010 Early United States History	3
SOC 1010 or 1100	3
AGHE 1020 Connections in Agriculture and Human Ecology	1
Total	28

Sophomore Year	sem. hrs.
AGHE 2022 Professionalism in Agriculture and Human Ecology	1
BIOL 2350 or BIOL 2010 and 2020	4
CHEM 3005 Elementary Organic Chemistry	4
ENGL 2130, 2235, or 2330	3
HEC 2020 Nutrition for Health Sciences	3
HEC 2031 or HEC 2041	3
HEC 2220 Medical Terminology for the Human Sciences	1
HEC 2240 Food Preparation & Management	4
Humanities/Fine Arts Elective ²	3
MATH 1530 Introductory Statistics	3
COMM 2025 Fundamentals of Communication	3
Total	29

Junior Year	sem. hrs.
AGHE 3000, 3200, 3275	3
HEC 3011 Consumer Economics	3
HEC 3201 Community Nutrition	3
HEC 3240 Quantity Food Production	4
HEC 3270 Nutrition in Disease	3
HEC 3290 Nutrition through the Life Cycle	3
Humanities/Fine Arts Elective ²	3
BIOL 3230 Health Science Microbiology	4
CHEM 4500 Nutritional Biochemistry	3
HIST 2020 Modern United States History	3
PSY 1030 Introduction to Psychology	3
Total	35

Senior Year	sem. hrs.
HEC 3565 Loss and Bereavement for Children and Families	3
HEC 4200 Advanced Nutrition	3

HEC 4242 Food Systems Administration	3
HEC 4271 Medical Nutrition Therapy	3
HEC 4272 Clinical Dietetics	3
HEC 4925 Nutrition Counseling and Education	3
HEC 4940 Nutrition, Fitness and Wellness	2
HEC 4994 Field Experience—Health Care*	3
BMGT 3510 Management & Organization Behavior	3
Elective	1
Total	28

- * Requires professional liability insurance (additional fee), background check (additional fee), proof of insurance, and proof of immunizations before entering HEC 4994.

- ¹ The Nutrition and Dietetics concentration is part of an accredited Didactic Program in Dietetics (DPD), which requires a mandatory enrollment policy. A total of **20 students will be enrolled each year at the junior level**, and a total of **20 students will be enrolled each year at the senior level**. Students should plan to apply for admission into upper division dietetics during the sophomore year. See www.tntech.edu/hec for application details.
- ² The Nutrition and Dietetics concentration is an accredited Didactic Program in Dietetics (DPD) by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics. Contact:
1-800-877-1600 Ext. 5400
Fax: 312-899-4817
acend@eatright.org
<http://www.eatright.org/ACEND/>
- ³ Select a Humanities/Fine Arts course from the general education list.

In order to become a Registered Dietitian/Nutritionist (RDN) and to practice as an RDN, the following steps must be completed:

1. After successful graduation from TTU's DPD program, gain acceptance and complete an accredited supervised practice program (Dietetic Internship).
2. Pass the Academy of Nutrition and Dietetics Registration Exam.
3. Obtain appropriate licensure in the state in which you will practice.

INTERDISCIPLINARY STUDIES (LIST)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH	3
Natural Science	8
Humanities/Fine Arts Electives	6
Electives ³	7
Total	30

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PC 2500 or COMM 2025	3
Social/Behavioral Science Electives	6

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Electives ³	12
Total	30

Junior Year	sem.
	hrs.
Concentration Area ^{1,2}	12
Electives ³	18
Total	30

Senior Year	sem.
	hrs.
Concentration Area ^{1,2}	12
Electives ³	15
LIST (PRST) 4995 Capstone Project	3
Total	30

¹ Concentration area courses must be upper division (3000, 4000).

² Concentration area #1 must be different from concentration area #2.

³ Eighteen hours of the elective hours must be upper division (3000, 4000).

A total of 12 hours out of the 120 hours must be at the 4000 level.

No more than 30 hours in business courses can be used toward graduation.

Students must complete at least 50 hours at the university (4-year) level and at least 30 hours at TTU.

INTERNATIONAL BUSINESS AND CULTURES (IBAC)

(Leading to the Bachelor of Science Degree)

Track I

Freshman Year	sem.
	hrs.
UBUS 1020 Success Skills for Business Studies.....	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2310 Early World History.....	3
HIST 2320 Modern World History.....	3
MATH 1130 College Algebra.....	3
Natural Science.....	8
DS 2810 Computer Applications in Business.....	3
Foreign Language 1010, 1020	6
Total	33

Sophomore Year	sem.
	hrs.
ACCT 2110 Principles of Accounting I	3
ACCT 2120 Principles of Accounting II	3
ECON 2010 Principles of Microeconomics.....	3
ECON 2020 Principles of Macroeconomics.....	3
ENGL 2330 Topics in World Literature.....	3
Foreign Language 2010, 2020	6
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
PC 2500 or COMM 2025.....	3
Total	30

Junior Year	sem.
	hrs.
BMGT 3510 Management & Organization Behavior.....	3

BMGT 3600 International Management	3
ECON 3320, 3810, or 3820.....	3
ECON 3610 Business Statistics I.....	3
FIN 3210 Principles of Managerial Finance	3
MKT 3400 Principles of Marketing	3
Foreign Language 3010, 3020	6
World Studies Elective ¹	3
Total	27

Senior Year	sem.
	hrs.
BMGT 4930 Business Strategy.....	3
ECON 4120 Natural Resource Economics	3
ECON 4510 International Trade & Finance.....	3
FIN 4910 Multinational Financial Management	3
MKT 4100 International Marketing	3
Foreign Language 3200	3
IBC 4980 Practicum	3
World Studies Electives ²	3
Business Elective	3
Elective	0-3
Total	30

¹ Students may choose from the following: ENGL 4720; FLST 3520; FREN 3510; GERM 3510 or 3520; SPAN 3510 or 3550 or any upper level foreign language class not used for the foreign language requirement; GEOG 1012, 1130, 2010, 3200; HIST 4440-4449, 4550, 4560, 4570, 4620, 4630, 4640, 4710, 4730, 4740, 4750, 4790-4799; POLS 4510, 4960; SOC 2100, 4090; COMM 3620

Track 2

Freshman Year	sem.
	hrs.
UBUS 1020 Success Skills for Business Studies ¹	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
HIST 2310 Early World History	3
HIST 2320 Modern World History	3
MATH 1130 College Algebra	3
Natural Science.....	8
DS 2810 Computer Applications in Business.....	3
SOC 1010 or ANTH 1100	3
Total	30

Sophomore Year	sem.
	hrs.
ACCT 2110 Principles of Accounting I	3
ACCT 2120 Principles of Accounting II	3
ECON 2010 Principles of Microeconomics	3
ECON 2020 Principles of Macroeconomics	3
ENGL 2130 Topics in American Literature.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
HEC 1020 Social and Professional Etiquette.....	1
POLS 1030 American Government.....	3
COMM 2025 or PC 2500.....	3
SOC 2110 or RELS 2010.....	3
Total	31

Junior Year	sem.
	hrs.
BMGT 3510 Management & Organization Behavior	3
BMGT 3600 International Management	3
BMGT 3720 Business Communication I	3

DS 43520 Operations Management	3
ECON 3320, 3810, or 3820	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance	3
MKT 3400 Principles of Marketing	3
POLS 3200 American Political Thought	3
American Studies Elective ²	3
Total	30

Senior Year	sem. hrs.
LAW 2810 Business Legal Environment and Ethics	3
ECON 4310 Labor Economics	3
ECON 4510 International Trade & Finance	3
FIN 4910 Multinational Financial Management	3
GEOG 1130 Geography of Natural Hazards	3
American Studies Electives ²	9
IBC 4980 Practicum	3-10
Electives	0-3
Total	30

¹ This course not included in 120-hour curriculum.

³ Students may choose from the following: ENGL 4610, 4830; HIST 4010, 4020, 4030, 4050, 4060, 4200, 4210, 4230-4239, 4250, 4330-4339, 4360-4369, 4380-4389; POLS 4210.

The following restrictions apply to both Track 1 and Track 2 IBAC majors:

- IBAC majors may not take business courses on a pass/fail basis.
- IBAC majors must take at least 50 percent of the total hours required for the degree in courses offered outside the College of Business.
- IBAC majors must earn at least 50 percent of the business hours required for the degree at Tennessee Technological University.
- IBAC majors must complete at least 50 percent of the upper-division business hours at Tennessee Technological University.

MARKETING (MKT)

(Leading to the Bachelor of Science in Business Administration degree)

For courses in the freshman and sophomore years, see Basic Business (page 110).

Junior Year	sem. hrs.
MKT 3400 Principles of Marketing	3
MKT Elective ¹	3
BMGT 3510 Management & Organization Behavior	3
DS 3520 Operations Management	3
DS 3620 Business Analytics: Data Driven Decision Making	3
DS 3841 Management Information Systems	3
ECON 3320, 3810, or 3820	3
ECON 3610 Business Statistics I	3
FIN 3210 Principles of Managerial Finance	3
Elective ¹	3
Total	30

Senior Year	sem. hrs.
BMGT 3720 Business Communication I	3
MKT 4620 Marketing Research	3
MKT 4730 Marketing Strategy	3
MKT Electives ¹	12
BMGT 4930 Business Strategy	3
LAW 2810 Business Legal Environment and Ethics	3
Business Elective ¹	3
Total	30

¹ Electives are to be selected in consultation with the academic advisor.

MATHEMATICS (MATH)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Approved Natural Science Sequence ²	8
Humanities/Fine Arts Elective	3
MATH 1020 First-Year Connections ¹	1
Electives	6
Total	31

Sophomore Year	sem. hrs.
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Electives	6
MATH 2010 Intro to Linear Algebra	3
MATH 2110 Calculus III	4
MATH 2120 Differential Equations	3
MATH 3400 Introduction to Concepts of Mathematics	3
ENGL 2130, 2235, or 2330	3
PC 2500 or COMM 2025	3
CSC 1300 or ENGR 1120	2-4
Total	30-32

Junior Year	sem. hrs.
MATH 3810 Complex Variables	3
MATH 4010 Modern Algebra I	3
MATH 4530 Linear Algebra I	3
MATH 4470 Probability and Statistics I	3
MATH 3430, 4410, or 4310	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Mathematics ³	3
Electives	6
Total	30

Senior Year	sem. hrs.
MATH 4110 Advanced Calculus I	3
Mathematics ³	9
Electives	17-15
Total	27-29

¹ This course not included in 120-hour curriculum.

² ASTR 1010-1020; or BIOL 1010-1020; or BIOL 1113-1123; or BIOL 1113-2310; or CHEM 1010-

1020; or CHEM 1110-1120; or GEOL 1040-1045; or PHYS 2110-2120.

- ³ Upper Division Mathematics courses (3000 or higher). The student must complete three Upper-Division sequences. The approved sequences are organized into Pure Mathematics and Applied Mathematics categories as shown below. The student must complete at least one sequence from each category. Depending upon which Upper-Division sequences are chosen, a student will need to take between 9 and 18 credit hours of Upper-Division Mathematics classes in addition to the mathematics courses specifically listed as required in the curriculum.

Applied Mathematics Sequence List: MATH 3070-3080, 4210-4220; 4250-4260; two of the three: 4350, 4360 or 4050; and 4470-4480.

Pure Mathematics Sequence List: MATH 4010-4020; 4110-4120; 4310-4320; 4530-4540; and 4850-4860.

To allow students to prepare for different career paths, four optional tracks are available: Actuarial, Applied Mathematics, Pure Mathematics, and Statistics. The following are courses recommended (but not required) for students in each track. The Actuarial Track is designed for students who want to pursue a career in the technical branches of Finance or insurance.

Actuarial Track: MATH 3070-3080, 4210-4220, 4470-4480, 4540, 6270.

The following courses from the College of Business (the courses marked with an asterisk comprise a Business Minor):

*ECON 2010-2020, *ACCT 3720, *BMGT 3510, *MKT 3400, *FIN 3210, *LAW 2810, FIN 3610, DS 2810, DS 3620.

The Applied Mathematics Track emphasizes courses needed by students who plan to work alongside scientists and engineers in industry. It is recommended that the student minor in Computer Science as a complement to this track.

Applied Mathematics Track: MATH 3810, 4510, 4540, two sequences from: MATH 3070-3080, 4210-4220, 4250-4260, 4350 and 4360, 4470-4480.

The Pure mathematics Track provides a good foundation for graduate study in a variety of subjects such as Economics, Finance, Business, Computer Science, Mathematics, and Physics.

Pure Mathematics Track: MATH 4020, 4120, 4310, 4350-4360, and 4540.

The Statistics Track prepares students for immediate entry into the workforce or for graduate study. Statistical knowledge is a powerful tool that is used in many fields such as Political Science, Business, Biology and Medicine.

Statistics Track: MATH 3070-3080, 4210-4220, 4470-4480, and 4540.

MECHANICAL ENGINEERING (ME)

(Leading to the Bachelor of Science in Mechanical Engineering Degree)

Freshman Year	sem. hrs.
CHEM 1110 General Chemistry I	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Humanities/Fine Arts Electives	6

MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
PHYS 2110 Calculus-based Physics I	4
ENGR 1110 Engineering Graphics	2
ENGR 1120 Programming for Engineers	2
ENGR 1020 Connections to Engineering & Technology ¹	1
Total	32

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
COMM 2025 or PC 2500	3
CEE 2110 Statics	3
ECE 2010 Electric Circuits I	3
MATH 2010 Introduction to Linear Algebra	3
MATH 2110 Calculus III	4
MATH 2120 Differential Equations	3
ME 2330 Dynamics	3
ME 3010 Materials and Process in Manufacturing	3
PHYS 2120 Calculus-based Physics II	4
Total	32

Junior Year	sem. hrs.
CEE 3110 Mechanics of Materials	3
ME 3001 Mechanical Engineering Analysis	3
ME 3023 Measurements in Mechanical Systems	3
ME 3050 Dynamic Modeling & Controls	3
ME 3060 Dynamic Modeling & Controls Lab	1
ME 3210 Thermodynamics I	3
ME 3220 Thermodynamics II	3
ME 3610 Dynamics of Machinery	3
ME 3710 Heat Transfer	3
ME 3720 Fluid Mechanics	3
ME 4910 Professionalism and Ethics	1
ME 4010 Machine Design	3
Total	32

Senior Year	sem. hrs.
Social/Behavioral Sciences Electives	6
ME 4020 or 4720	3
ME 4410 Senior Design Project I	3
ME 4420 Senior Design Project II	3
ME 4751 Energy Systems Lab	2
Area of Emphasis	15
Total	32

¹ ENGR 1020 Connections to Engineering and Technology required in the first semester freshman year to fulfill TTU's UNIV 1020 requirement. Does not count toward the 128 credit hour BSME degree.

Area of Emphasis (AOE) Courses

Category 1: Mechanical engineering elective courses (a minimum of 9 credit hours must be taken from this category for AOE)

ME 4020, 4060, 4120, 4140, 4160, 4180, 4190, 4210, 4220, 4260, 4310, 4370, 4460, 4470, 4480, 4490, 4510, 4610, 4620, 4630, 4640, 4720, 4730, 4810, 4900 (maximum of three credit hours shall be counted as AOE), 4930, 4990 (maximum of three credit hours shall be counted as AOE)

Any ME 6000-level courses may be used with prior approval of both the course instructor and the ME department chair/associate chair. The

student must be within 18 credit hours of graduation.

Category 2: Mathematics directly applicable to mechanical engineering

MATH 3470, 3810, 4210, 4220, 4250, 4510, 4530, 4710

Category 3: Select General Engineering, Business, Writing and Technology courses (maximum of three credit hours shall be counted as AOE)

BMGT 3510, ENGL 3520, ENGR 4510, ENTR 4500, MET 4400, MET 4450, MET 4650

Category 4: Miscellaneous Engineering and Science Courses

Other upper division (3000 and 4000-level) engineering and science courses may be used with prior approval of both the course instructor and the ME department.

MECHANTRONICS CONCENTRATION (MECH)

(Leading to the Bachelor of Science in Mechanical Engineering Degree)

Freshman Year	sem. hrs.
CHEM 1110 General Chemistry I	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Humanities/Fine Arts Elective.....	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
PHYS 2110 Calculus-based Physics I.....	4
CSC 1300 Introduction to Problem Solving and Computer Programming	4
ENGR 1020 Connections to Engineering & Technology ¹	1
ENGR 1110 Engineering Graphics.....	2
Total	32

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
COMM 2025 or PC 2500	3
CEE 2110 Statics	3
ECE 2010 Electric Circuits I	3
ECE 2011 Electrical Engineering Lab	1
ECE 2110 Introduction to Digital Systems.....	3
MATH 2010 Introduction to Linear Algebra	3
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations	3
ME 2330 Dynamics	3
ME 3001 Mechanical Engineering Analysis.....	3
PHYS 2119 Calculus-based Physics II.....	3
Total	35

Junior Year	sem. hrs.
CEE 3110 Mechanics of Materials	3
ME 3010 Materials & Processes in Manufacturing.....	3
ME 3023 Measurements in Mechanical Systems	3
ME 3050 Dynamic Modeling & Controls.....	3
ME 3060 Dynamic Modeling & Controls Lab	1
ME 3210 Thermodynamics I.....	3
ME 3220 Thermodynamics II.....	3
ME 3610 Dynamics of Machinery.....	3
ME 3710 Heat Transfer	3
ME 3720 Fluid Mechanics	3

ME 4010 Machine Design	3
ME 4910 Professionalism and Ethics.....	1
Total	32

Senior Year	sem. hrs.
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Electives.....	6
ECE 3130 Microcomputer Systems	4
ME 4370 Mechatronics and Intelligent Machines Engineering.....	3
ME 4410 Senior Design Project I	3
ME 4420 Senior Design Project II	3
ME 4020 or 4720	3
ME 4751 Energy Systems Lab.....	2
ECE 3210 ² or ME 4810	3
Total	30

¹ ENGR 1020 is not part of the 128 hour curriculum.

² ECE 3260 (1) recommended if taking ECE 3210.

MULTIDISCIPLINARY STUDIES (MDS)

ENGLISH AS A SECOND LANGUAGE (ESL)

((Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.))

Freshman Year	sem. hrs.
Natural Science.....	8
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology..	2
FOED 1820 or 1822	1
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Social/Behavioral Sciences Elective	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
Total	32

Sophomore Year	sem. hrs.
ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or 2330	3
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences Elective	3
EDPY 2210 Educational Psychology	3
MATH Elective	3
Humanities/Fine Arts Elective	3
FREN/GERM/SPAN 2010, 2020 ¹	6
Elective	1
Total	28

Junior Year	sem. hrs.
CFS 3600 Family, Community & Professional Partnerships.....	2
CUED 4700 Educational Data and Assessment	2
ECSP 4100 Developmentally Appropriate Practices: K-4.....	3
ESLP 4100 ESL Methodology & Materials for PreK-12 or TEAE 4020	3
ESLP 4200 ESL Assessment: Reading & Writing	

or TEAE 4437.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3810 Field Experiences in Education	2
FOED 3840 Field Experience in ESL	1
FREN/GERM/SPAN 3550, 3510, or 3520	3
LING (ENGL) 4511 Introduction to Descriptive Linguistics or TEAE 4500	3
READ 3313 Literacy for Special Populations	5
SPED 3050 Universal Design for Special Education ..	5
Total	35

Senior Year	sem. hrs.
ELED 4871 Residency I	5
ELED 4872 Professional Seminar I	5
ELED 4881 Residency II	10
ELED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	25

¹ Those students who do not place at the 2010 level as determined by a proficiency test administered by the Department of Foreign Languages or those students who have not taken two years of foreign language in high school will take 1010, 1020 and 2010 for nine hours in the same language.

GENERAL (MDSG)

(Leading to the Bachelor of Science, Non-Licensure)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Any general education approved science sequence (8 hours) or any combination of general education approved science to total 12 hours. 6-8	
MATH 1010, 1130, 1410, 1530, 1630, 1710, 1830 or MATH 1410, 1420	6
Social/Behavioral Sciences Electives ²	6
PHED	1
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
Total	30

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
BIOL 1080, CHEM 1310, GEOL 1070, PHYS 1310 or Science Sequence ¹	6-8
COMM 2025 or PC 2500	3
Humanities/Fine Arts Electives ³	6
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
EXPW 2130 or 2430	3
SPED 2010 or any 3000/4000 level SPED course	3
Total	30-32

Junior Year	sem. hrs.
HEC 2200, 3500, or 3520	2-3
Any two different areas from (MUS 3530,	

THEA 4500, any 3000/4000 level HIST, any 3000/4000 level PHIL, any 3000/4000 level PSY, any 3000/4000 level SOC)	5-6
EXPW 2130 or 2430	2-3
FOED 3010 Integrating Instructional Technology into the Classroom	3
Guided Electives	8
Upper Division General Electives	9-10
Total	32

Senior Year	sem. hrs.
EDPY 2210, 3300, or PSY 4100	3
CJ 3650, CJ 4250, SOC 4510, SOC 4500, PSY 4130, PSY 4400 or READ/LSCI 4570 or PSY 4050	3
Guided Electives	7
Electives (36 hours of total program must be taken at the 3000/4000 level) The program of study will total 120 hours	10-19
Total	24-35

- Complete a sequence (eight semester hours) or total of 12 semester hours selected from BIOL, CHEM, PHYS or GEOL.
- Select two courses from: ANTH 1100; ECON 2010, 2020; GEOG 1012; POLS 1030; PSY 1030 or SOC 1010.
- Select two courses from: ART 1035; HIST 2210, 2220, 2310, 2320; MUS 1030; PHIL 1030; THEA 1030; ENGL 2130, 2235 or 2330.

Note: A minimum of 36 Upper Division hours are required for graduation.

MIDDLE SCHOOL ENGLISH, 6-8 (MSE)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
COMM 2025 or PC 2500	3
Natural Science Sequence	8
MATH	3
Humanities/Fine Arts Elective	3
Total	32

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2330 Topics in World Literature	3
ENGL 3910 American Literature I	3
ENGL 3810 British Literature I	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
Foreign Language	3
Humanities/Fine Arts Elective	3
HEC 3500 Development: Middle Childhood/Adolescence	3
Social/Behavioral Sciences Electives	6

Elective.....	1
Total	31

Junior Year	sem. hrs.
ENGL 3820 British Literature II.....	3
ENGL 3920 American Literature II	3
ENGL 4121 Shakespeare.....	3
ESLP 4100 ESL Methodology and Materials for PreK-12.....	3
FOED 3820 Field Experiences in Education	2
READ 3312 Literacy II-Middle School Reading Program	7
READ 3350 Teaching Reading in the Content Areas.....	3
READ 4570 Young Adult Literature.....	3
SEED 4120 Materials and Methods of Teaching English	3
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	33

Senior Year	sem. hrs.
CUED 4700 Educational Data and Assessment.....	2
ELED 4871 Residency I	5
ELED 4872 Professional Seminar I	5
ELED 4881 Residency II	10
ELED 4882 Professional Seminar II	2
Total	25

MIDDLE SCHOOL MATH, 6-8 (MSM)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
COMM 2025 or PC 2500.....	3
Natural Science Sequence	8
Total	32

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology.....	3
ENGL 2130 Topics in American Literature	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
HEC 3500 Development: Middle Childhood/Adolescence.....	3
MATH 1130 College Algebra.....	3
MATH 1530 Introductory Statistics	3
MATH 1630 Finite Mathematics	3
Humanities/Fine Arts Electives.....	6
Social/Behavioral Sciences Electives.....	6
Elective.....	1
Total	34

Junior Year	sem. hrs.
ESLP 4100 ESL Methodology and Materials for PreK-12.....	3
FOED 3820 Field Experiences in Education	2
MATH 1720 Pre-calculus Trigonometry	3
READ 3312 Literacy II-Middle School Reading Program	7
READ 3350 Teaching Reading in the Content Areas	3
SEED 4122 Materials and Methods of Teaching Mathematics.....	3
SEED 4422 Teaching Secondary Mathematics Using Technology	3
SEED 4322 Teaching Algebra in Middle/High School	3
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	30

Senior Year	sem. hrs.
CUED 4700 Educational Data and Assessment	2
ELED 4871 Residency I	5
ELED 4872 Professional Seminar I	5
ELED 4881 Residency II	10
ELED 4882 Professional Seminar II.....	2
Total	25

MIDDLE SCHOOL SCIENCE, 6-8 (MSSC)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
CHEM 1110 General Chemistry I.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
GEOL 1045 Earth Environment, Resources and Society	4
MATH 1530 Introductory Statistics.....	3
MATH 1710 Pre-calculus I	3
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective	3
Total	33

Sophomore Year	sem. hrs.
ASTR 1010 or 1020	4
BIOL 3120 General Ecology	3
EDPY 2210 Educational Psychology	3
ENGL 2130 Topics in American Literature	3
HIST 1310 Science and World Cultures.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHYS 2010 Algebra-based Physics I.....	4
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences Elective	3
Total	32

Junior Year	sem. hrs.
CUED 4400 Teaching Methods for Physical Sciences.....	3
CUED 4700 Educational Data and Assessment.....	2
ESLP 4100 ESL Methodology and Materials for PreK-12.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
HEC 3500 Development: Middle Childhood/Adolescence.....	3
READ 3312 Literacy II-Middle School Reading Program	7
READ 3350 Teaching Reading in the Content Areas.....	3
SEED 4123 Materials and Methods of Teaching The Sciences	3
Elective.....	1
Total	30

Senior Year	sem. hrs.
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
ELED 4871 Residency I	5
ELED 4872 Professional Seminar I	5
ELED 4881 Residency II	10
ELED 4882 Professional Seminar II	2
Total	25

MIDDLE SCHOOL SOCIAL STUDIES, 6-8 (MSSS)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
GEOG 1012 Cultural Geography.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
POLS 1030 American Government	3
Natural Science Sequence	8
MATH	3
Total	32

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology.....	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
HIST 2210 Early Western Civilization.....	3
HIST 2220 Modern Western Civilization.....	3
HIST 2320 Modern World History.....	3
COMM 2025 or PC 2500.....	3
Elective from ECON, POLS, GEOG or HIST.....	3
Humanities/Fine Arts Electives.....	3
Social/Behavioral Sciences Elective.....	3
Elective.....	1
Total	31

Junior Year	sem. hrs.
ESLP 4100 ESL Methodology and Materials for PreK-12.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
HEC 3500 Development: Middle Childhood/Adolescence	3
Upper Division HIST.....	6
READ 3312 Literacy II-Middle School Reading Program	7
READ 3350 Teaching Reading in the Content Areas	3
SEED 4124 Materials and Methods of Teaching Social Studies	3
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	33

Senior Year	sem. hrs.
CUED 4700 Educational Data and Assessment	2
ELED 4871 Residency I	5
ELED 4872 Professional Seminar I	5
ELED 4881 Residency II	10
ELED 4882 Professional Seminar II.....	2
Total	24

MUSIC (MUS)

INSTRUMENTAL/GENERAL LICENSURE (MUIN)

(Leading to the Bachelor of Music Degree and the Apprentice License, with endorsement, Grades K-12)

Freshman Year	sem. hrs.
UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH.....	3
MUS 1013 Recital Class	0
MUS 1021 Class Voice Instruction I.....	1
MUS 1030 Music Appreciation	3
MUS 1070 Concert Choir	1
MUS 1120 Harmony I.....	3
MUS 1130 Aural Techniques I	1
MUS 1140 Harmony II.....	3
MUS 1150 Aural Techniques II	1
Applied Music.....	2
Instrument Class ²	2
Major Ensemble	2
Social/Behavioral Sciences Elective	3
Total	31

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
Natural Science.....	8
EDPY 2210 Educational Psychology	3
MUED 1820 Introduction to Music Education.....	1
MUS 1013 Recital Class	0
MUS 1023 Intermediate Class Piano for Music Majors III	1
MUS 1024 Intermediate Class Piano for Music Majors IV	1

MUS 2110 Harmony III.....	2
MUS 2120 Aural Techniques III.....	1
MUS 2130 Harmony IV.....	2
MUS 2140 Aural Techniques IV	1
MUS 3010 Music History & Literature I.....	3
MUS 3020 Music History & Literature II.....	3
Applied Music.....	2
Instrument Class ²	1
Major Ensemble	2
Total	34

Junior Year

sem.
hrs.

HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Social/Behavioral Sciences Elective.....	3
COMM 2025 or PC 2500.....	3
MUED 3110 Materials & Methods in Music, Grades K-5.....	3
MUED 3130 Materials and Methods in Instrumental Music, Grades 6-12.....	3
MUED 3230 (Wind/Percussion Majors Only) or MUED 3735 (String Majors Only).....	2
MUED 3620 Fundamentals of Conducting	1
MUED 3630 Instrumental Conducting & Literature.....	2
MUS 1013 Recital Class.....	0
MUS 3130 Form & Analysis	2
MUS 3210 Instrumentation	2
MUS 4510 Computer Applications in Music	2
Applied Music.....	2
Instrument Classes ³	2
Major Ensemble	2
Total	35

Senior Year

sem.
hrs.

MUED 4871 Residency I.....	5
MUED 4872 Professional Seminar I.....	5
MUED 4881 Residency II	10
MUED 4882 Professional Seminar II.....	2
MUS 4000 Senior Recital	1
Applied Music.....	1
Major Ensemble	1
Total	25

¹ This course not included in 125-hour curriculum.

² Instrument classes, 5 hours. Take MUS 1031, 1041, and 1051, plus two from: 1032 (string students), 1042 (brass and percussion students), 1052 (woodwind and percussion students), 1071 (woodwind, brass, strings, piano and guitar students) or 1081 (piano and guitar students).

³ Must submit evidence of current First Aid/CPR training.

PRIMARY LICENSURE: INSTRUMENTAL MUSIC EDUCATION

ADDITIONAL LICENSURE: VOCAL/GENERAL MUSIC EDUCATION

The student must satisfy current TTU requirements for the B.M. in Music Education, MUIN option, plus the following courses:

MUED 3140	3
MUED 3840	1

MUS 1100 or 1200 (voice or piano)	3
MUS 1210/1220	2
MUS 1050, or 1060, or 1070	3
MUS 3800	2
Total	14

VOCAL/GENERAL LICENSURE (MUVO)

(Leading to the Bachelor of Music Degree and the Apprentice License, with endorsement, Grades K-12)

Freshman Year

sem.
hrs.

UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH	3
Social/Behavioral Sciences Elective	3
MUS 1030 Music Appreciation	3
MUS 1120 Harmony I.....	3
MUS 1130 Aural Techniques I	1
MUS 1140 Harmony II.....	3
MUS 1150 Aural Techniques II	1
MUS 1210 Diction for Singers I.....	1
MUS 1220 Diction for Singers II.....	1
Applied Music.....	2
Major Ensemble	2
Total	29

Sophomore Year

sem.
hrs.

ENGL 2130, 2235 or 2330	3
Natural Science.....	8
COMM 2025 or PC 2500.....	3
EDPY 2210 Educational Psychology	3
MUED 1820 (Fall only) Introduction to Music Education.....	1
MUS 1016 or MUS 1023 and 1024	2
MUS 2110 Harmony III.....	2
MUS 2120 Aural Techniques III	1
MUS 2130 Harmony IV	2
MUS 2140 Aural Techniques IV	1
MUS 3010 Music History & Literature I	3
MUS 3020 Music History & Literature II	3
Applied Music.....	2
Major Ensemble	2
Total	36

Junior Year

sem.
hrs.

HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Social/Behavioral Sciences Electives.....	6
MUED 3110 Materials & Methods in Music, Grades K-5.....	3
MUED 3140 Materials & Methods in Vocal Music, Grades 6-12.....	3
MUED 3620 Fundamentals of Conducting	1
MUED 3640 Choral Conducting & Literature	2
MUS 3130 Form & Analysis	2
MUS 3240 Choral Literature	2
MUS 3800 Vocal Pedagogy & Literature I.....	2
MUS 4510 Computer Applications in Music.....	2
Applied Music.....	2
Major Ensemble	2
Total	33

Senior Year	sem. hrs.
MUED 4871 Residency I	5
MUED 4872 Professional Seminar I	5
MUED 4881 Residency II	10
MUED 4882 Professional Seminar II	2
MUS 4000 Senior Recital	1
Applied Music	1
Major Ensemble	1
Total	25

¹ This course not included in 123-hour curriculum.

² Must submit evidence of current First Aid/CPR training.

PRIMARY LICENSURE: VOCAL/GENERAL MUSIC EDUCATION

ADDITIONAL LICENSURE: INSTRUMENTAL MUSIC EDUCATION

The above curriculum is necessary for licensure in Vocal/General Music. If licensure in Instrumental Music Education is also desired, then the following courses also need to be completed:

MUED 3130	3
MUED 3830	1
MUS 1000 (band/orch. Inst)	3
MUS 1033/1085/1045	3
MUED 3230	2
MUS 1031, 1041, 1051, 1071	4
Total	16

MUSIC PERFORMANCE (MUPE)

EMPHASIS: COMPOSITION

(Leading to the Bachelor of Music Degree)

Freshman Year	sem. hrs.
UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH	3
MUS 1000 Private Composition	3
MUS 1013 Recital Class	0
MUS 1021 Class Voice Instruction I	2
MUS 1023 Intermediate Class Piano for Music Majors III	1
MUS 1024 Intermediate Class Piano for Music Majors IV	1
MUS 1030 Music Appreciation	3
MUS 1120 Harmony I	3
MUS 1130 Aural Techniques I	1
MUS 1140 Harmony II	3
MUS 1150 Aural Techniques II	1
Applied Music	2
Major Ensemble	2
Total	31

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
MUS 1000 Private Composition	4
MUS 1013 Recital Class	0
MUS 1100 Private Piano	2
MUS 2110 Harmony III	2
MUS 2120 Aural Techniques III	1
MUS 2130 Harmony IV	2
MUS 2140 Aural Techniques IV	1
MUS 4510 Computer Applications in Music	2
COMM 2025 or PC 2500	3
Natural Science	8
Social/Behavioral Sciences Elective	3
Applied Music	2
Major Ensemble	2
Total	35

Junior Year	sem. hrs.
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MUS 1013 Recital Class	0
MUS 3000 Private Composition	4
MUS 3010 Music History & Literature I	3
MUS 3020 Music History & Literature II	3
MUS 3130 Form & Analysis	2
MUS 3140 Counterpoint	3
MUS 3210 Instrumentation	2
MUS 3950 Junior Recital	1
Applied Music	2
Major Ensemble	2
Total	28

Senior Year	sem. hrs.
MUED 3620 Fundamentals of Conducting	1
MUED 3630 or 3640	2
MUS 1013 Recital Class	0
MUS 3000 Private Composition	4
MUS 3220 Jazz Composition & Arranging I	2
MUS 4000 Senior Recital	1
MUS 4120 Contemporary Music	2
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective	3
MUS 3710 Pedagogy & Literature I	2
MUS 3720 Pedagogy & Literature II	2
Applied Music	2
Major Ensemble	2
Total	26

¹ This course not included in 120-hour curriculum.

MUSIC PERFORMANCE (MUPE)

OPTION: INSTRUMENTAL

(Leading to the Bachelor of Music Degree)

Freshman Year	sem. hrs.
UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH	3
MUS 1013 Recital Class	0
MUS 1021 Class Voice Instruction I	1

MUS 1023 Intermediate Class Piano for Music	
Majors III	1
MUS 1024 Intermediate Class Piano for Music	
Majors IV	1
MUS 1030 Music Appreciation	3
MUS 1070 Concert Choir	1
MUS 1120 Harmony I	3
MUS 1130 Aural Techniques I	1
MUS 1140 Harmony II	3
MUS 1150 Aural Techniques II	1
Social/Behavioral Sciences Elective	3
Applied Music	4
Major Ensemble	2
Total	33

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
MUS 1013 Recital Class	0
MUS 1081 Improvisation	1
MUS 1082 Improvisation II	1
MUS 2110 Harmony III	2
MUS 2120 Aural Techniques III	1
MUS 2130 Harmony IV	2
MUS 2140 Aural Techniques IV	1
MUS 4510 Computer Applications in Music	2
Natural Science	8
Social/Behavioral Sciences Elective	3
COMM 2025 or PC 2500	3
Applied Music	4
Major Ensemble	2
Total	33

Junior Year	sem.
	hrs.
HIST 2010 Early United States History	3
MUED 3620 Fundamentals of Conducting	1
MUED 3630 Instrumental Conducting and	
Literature	2
MUS 1013 Recital Class	0
MUS 3010 Music History & Literature I	3
MUS 3020 Music History & Literature II	3
MUS 3130 Form & Analysis	2
MUS 3210 Instrumentation	2
MUS 3710 Pedagogy & Literature I	2
MUS 3720 Pedagogy & Literature II	2
MUS 3950 Junior Recital	1
Applied Music	4
Minor Ensemble	2
Major Ensemble	2
Total	29

Senior Year	sem.
	hrs.
HIST 2020 Modern United States History	3
Humanities/Fine Arts Elective	3
MUS 1013 Recital Class	0
MUS 4000 Senior Recital	1
MUS 4120 Contemporary Music	2
MUS 4250 Recording Techniques	2
MUS 4710 Supervised Teaching Experience I	2
MUS 4720 Supervised Teaching Experience II	2
Electives	2
Applied Music	4
Minor Ensemble	2
Major Ensemble	2
Total	25

¹ This course not included in 120-hour curriculum.

MUSIC PERFORMANCE (MUPE)

OPTION: JAZZ

(Leading to the Bachelor of Music Degree)

Freshman Year	sem.
	hrs.
UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Any General Education Math	3
MUS 1013 Recital Class	0
MUS 1021 Class Voice Instruction I	1
MUS 1023 Intermediate Class Piano for Music	
Majors III	1
MUS 1024 Intermediate Class Piano for Music	
Majors IV	1
MUS 1030 Music Appreciation	3
MUS 1120 Harmony I	3
MUS 1130 Aural Techniques I	1
MUS 1140 Harmony II	3
MUS 1150 Aural Techniques II	1
Applied Music	4
Major Ensemble	2
Total	29

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
MUS 1013 Recital Class	0
MUS 1070 Concert Choir	1
MUS 1081 Improvisation I	1
MUS 1082 Improvisation II	1
MUS 2110 Harmony III	2
MUS 2120 Aural Techniques III	1
MUS 2130 Harmony IV	2
MUS 2140 Aural Techniques IV	1
MUS 4510 Computer Applications in Music	2
Natural Science	8
COMM 2025 or PC 2500	3
MUS 1090 Jazz Ensemble	2
Applied Music	4
Major Ensemble	2
Total	33

Junior Year	sem.
	hrs.
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MUED 3620 Fundamentals of Conducting	1
MUS 1013 Recital Class	0
MUS 1090 Jazz Ensemble	2
MUS 3010 Music History & Literature I	3
MUS 3020 Music History & Literature II	3
MUS 3130 Form & Analysis	2
MUS 3210 Instrumentation	2
MUS 3950 Junior Recital	1
MUS 4110 History & Literature of Jazz	2
Applied Music	4
Major Ensemble	2
Total	28

Senior Year	sem. hrs.
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Electives.....	6
MUS 1013 Recital Class.....	0
MUS 1090 Jazz Ensemble.....	2
MUS 3220 Jazz Composition & Arranging I.....	2
MUS 3230 Jazz Composition & Arranging II.....	2
MUS 3710 Pedagogy & Literature I.....	2
MUS 3720 Pedagogy & Literature II.....	2
MUS 4000 Senior Recital.....	1
MUS 4120 Contemporary Music.....	2
MUS 4250 Recording Techniques.....	2
Applied Music.....	4
Major Ensemble.....	2
Total	30

¹ This course not included in 120-hour curriculum.

MUSIC PERFORMANCE (MUPE)

OPTION: PIANO

(Leading to the Bachelor of Music Degree)

Freshman Year	sem. hrs.
UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH.....	3
MUS 1013 Recital Class.....	0
MUS 1016 Accompanying.....	2
MUS 1021 Class Voice Instruction I.....	1
MUS 1030 Music Appreciation.....	3
MUS 1070 Concert Choir.....	1
MUS 1120 Harmony I.....	3
MUS 1130 Aural Techniques I.....	1
MUS 1140 Harmony II.....	3
MUS 1150 Aural Techniques II.....	1
Applied Music.....	4
Major Ensemble.....	2
Total	30

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
MUS 1013 Recital Class.....	0
MUS 1016 Accompanying.....	2
MUS 1081 Improvisation I.....	1
MUS 1082 Improvisation II.....	1
MUS 2110 Harmony III.....	2
MUS 2120 Aural Techniques III.....	1
MUS 2130 Harmony IV.....	2
MUS 2140 Aural Techniques IV.....	1
MUS 4510 Computer Applications in Music.....	2
Natural Science.....	8
Social/Behavioral Sciences Elective.....	3
COMM 2025 or PC 2500.....	3
Applied Music.....	4
Major Ensemble.....	2
Total	35

Junior Year	sem. hrs.
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3

MUED 3620 Fundamentals of Conducting.....	1
MUS 1005 Chamber Music.....	1
MUS 1013 Recital Class.....	0
MUS 1016 Accompanying.....	2
MUS 3010 Music History & Literature I.....	3
MUS 3020 Music History & Literature II.....	3
MUS 3130 Form & Analysis.....	2
MUS 3710 Pedagogy & Literature I.....	2
MUS 3720 Pedagogy & Literature II.....	2
MUS 3950 Junior Recital.....	1
Applied Music.....	4
Major Ensemble.....	2
Total	29

Senior Year	sem. hrs.
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Elective.....	3
MUS 1013 Recital Class.....	0
MUS 1016 Accompanying.....	2
MUS 4000 Senior Recital.....	1
MUS 4120 Contemporary Music.....	2
MUS 4250 Recording Techniques.....	2
MUS 4710 Supervised Teaching Experience I.....	2
MUS 4720 Supervised Teaching Experience II.....	2
Applied Music.....	4
Major Ensemble.....	2
Electives (Upper Division).....	3
Total	26

¹ This course not included in 120-hour curriculum.

MUSIC PERFORMANCE (MUPE)

OPTION: VOCAL

(Leading to the Bachelor of Music Degree)

Freshman Year	sem. hrs.
UNMU 1020 First-Year Connections ¹	1
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH.....	3
MUS 1013 Recital Class.....	0
MUS 1023 Intermediate Class Piano for Music Majors III.....	1
MUS 1024 Intermediate Class Piano for Music Majors IV.....	1
MUS 1030 Music Appreciation.....	3
MUS 1120 Harmony I.....	3
MUS 1130 Aural Techniques I.....	1
MUS 1140 Harmony II.....	3
MUS 1150 Aural Techniques II.....	1
MUS 1210 Diction for Singers I.....	1
MUS 1220 Diction for Singers II.....	1
Social/Behavioral Sciences Elective.....	3
Applied Music.....	4
Major Ensemble.....	2
Total	33

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
MUS 1013 Recital Class.....	0
MUS 2110 Harmony III.....	2
MUS 2120 Aural Techniques III.....	1

MUS 2130 Harmony IV.....	2
MUS 2140 Aural Techniques IV	1
MUS 4510 Computer Applications in Music	2
Natural Science	8
Social/Behavioral Sciences Elective.....	3
COMM 2025 or PC 2500.....	3
MUS 3006 Opera Workshop	1
Applied Music.....	4
Major Ensemble	2
Total	32

Junior Year	sem. hrs.
Humanities/Fine Arts Elective.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Foreign Language	6
MUS 1013 Recital Class.....	0
MUS 3010 Music History & Literature I.....	3
MUS 3020 Music History & Literature II.....	3
MUS 3130 Form & Analysis	2
MUS 3950 Junior Recital.....	1
MUS 3006 Opera Workshop	1
Applied Music.....	4
Major Ensemble	2
Electives (Upper Division)	2
Total	33

Senior Year	sem. hrs.
Humanities/Fine Arts Elective.....	3
MUED 3620 Fundamentals of Conducting	1
MUED 4510 or 4520.....	2
MUS 1013 Recital Class.....	0
MUS 3006 Opera Workshop	1
MUS 3240 Choral Literature.....	2
MUS 3800 Vocal Pedagogy and Literature I	2
MUS 3810 Vocal Pedagogy and Literature II	2
MUS 4000 Senior Recital	1
MUS 4120 Contemporary Music	2
Applied Music.....	4
Major Ensemble	2
Total	22

¹ This course not included in 120-hour curriculum.

NURSING (NURS)

(Leading to the Bachelor of Science in Nursing Degree)

Freshman Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
CHEM 1210 Chemistry for the Life Sciences	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Elective.....	3
SOC 1010 Introduction to Sociology	3
MATH 1130 or 1530.....	3
NURS 1020 First Year Connection:	
University & Nursing ¹	1
NURS 2300 Introduction to Professional	
Nursing Concepts I.....	2
Total	31

Sophomore Year	sem. hrs.
BIOL 3230 Health Science Microbiology.....	4
BIOL 2020 Human Anatomy & Physiology II.....	4
HEC 2020 Nutrition for Health Sciences	3
NURS 3240 Pharmacological Concepts in Nursing ...	3
NURS 3260 Health Assessment and Promotion.....	2
NURS 3261 Health Assessment and Promotion Lab .	1
NURS 3270 Fundamentals of Nursing.....	2
NURS 3271 Fundamentals of Nursing Lab	1
PSY 1030 Introduction to Psychology	3
COMM 2025 or PC 2500.....	3
ENGL 2130, 2235, or 2330	3
Humanities/Fine Arts Elective	3
Total	32

Junior Year	sem. hrs.
NURS 3250 Medical Surgical Nursing I	4
NURS 3280 Medical Surgical Nursing I: Lab	3
NURS 3290 Pathophysiological Processes for the	
Professional Nurse I.....	2
NURS 3350 Medical Surgical Nursing II	4
NURS 3361 Medical Surgical Nursing II: Lab	3
NURS 3370 Mental Health Nursing.....	3
NURS 3371 Mental Health Nursing: Lab.....	2
NURS 3390 Pathophysiological Processes for the	
Professional Nurse II.....	2
NURS 4800 Gerontological Nursing.....	2
Nursing Elective ²	2
Total	27

Senior Year	sem. hrs.
NURS 4000 Women's Health & Perinatal	
Nursing.....	3
NURS 4001 Women's Health & Perinatal	
Nursing: Lab.....	2
NURS 4100 Nursing Care of Children.....	3
NURS 4101 Nursing Care of Children: Lab.....	2
NURS 4230 Pharmacological Concepts in	
Nursing II.....	2
NURS 4300 Research in Health Care	3
NURS 4351 Health of Communities: Lab.....	3
NURS 4430 Health Care of Communities	3
NURS 4450 Leadership & Management.....	3
NURS 4451 Leadership & Management: Lab	4
NURS 4460 Preparation for Licensure.....	1
Nursing Elective ²	1
Total	31

BIOL 1123 is required for those with Natural Science ACT score below 17.

- ¹ This course not included in 120-hour curriculum. Course is taken by incoming freshman only.
- ² A total of three hours of Nursing or other electives approved and substituted with permission from the Nursing School.
- ³ Students who require readmission to the nursing program after an unsuccessful semester will be required to take NURS 4990, a special topics course focused on testing remediation and study habits.

NURSING (NURN)**RN/BSN****(Leading to the Bachelor of Science in Nursing Degree)**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Humanities/Fine Arts Electives	6
SOC 1010 Introduction to Sociology	3
MATH 1130 or 1530	3
COMM 2025 or PC 2500	3
Electives	7
Total	28

Sophomore Year	sem. hrs.
BIOL 3230 Health Science Microbiology	4
BIOL 2010 Human Anatomy & Physiology I	4
BIOL 2020 Human Anatomy & Physiology II	4
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PSY 1030 Introduction to Psychology	3
ENGL 2130, 2235, or 2330	3
Electives	6
Total	30

Junior Year	sem. hrs.
NURS 3250 Medical Surgical Nursing I ¹	4
NURS 3260, 3261 or 3281	3
NURS 3270 Fundamentals of Nursing ¹	2
NURS 3271 Fundamentals of Nursing Lab	1
NURS 3280 Medical Surgical Nursing I: Lab ¹	3
NURS 3350 Medical Surgical Nursing II ¹	4
NURS 3465 Bridging to Professional Nursing Practice	4
NURS 3361 Medical Surgical Nursing II: Lab ¹	3
NURS 3370 Mental Health Nursing ¹	3
NURS 3371 Mental Health Nursing: Lab ¹	2
NURS 3380 Pathophysiological Processes for the Professional Nurse	3
Total	32

Senior Year	sem. hrs.
NURS 3430 Survey of Pharmacological Aspects of Nursing	3
NURS 4000 Women's Health & Perinatal Nursing ¹	3
NURS 4001 Women's Health & Perinatal Nursing: Lab ¹	2
NURS 4100 Nursing Care of Children ¹	3
NURS 4101 Nursing Care of Children: Lab ¹	2
NURS 4300 Research in Health Care	3
NURS 4350 Health Care of Communities	4
NURS 4431 Health of Communities: Lab	3
NURS 4450 Leadership & Management	3
NURS 4451 Leadership & Management: Lab	4
Total	30

¹ Thirty-two credit hours are awarded for these courses upon completion of 12 hours of NURS coursework.

PHYSICS (PHYS)**(Leading to the Bachelor of Science Degree)****Option 1**

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
Humanities/Fine Arts Elective	3
MATH 1910 Calculus I	4
MATH 1920 Calculus II	4
PHYS 2110 Calculus-based Physics I	4
PHYS 1137 Frontiers of Physics	1
Total	30

Sophomore Year	sem. hrs.
CSC 1300 Introduction to Problem Solving and Computer Programming	4
CSC 1310 Data Structures and Algorithms	4
ENGL 2130, 2235, or 2330	3
MATH 2110 Calculus III	4
MATH 2120 Differential Equations	3
PHYS 2120 Calculus-based Physics II	4
PHYS 2420 Modern Physics	3
PHYS 2920 Mathematical Physics	3
PC 2500 Communicating in the Professions	3
Total	31

Junior Year	sem. hrs.
PHYS 3120 or 3610 ¹	3
PHYS 3810 Quantum Mechanics I	3
PHYS 4610 Classical Electricity & Magnetism I	3
PHYS 4620 Classical Electricity & Magnetism II	3
PHYS 4710 Advanced Experimental Physics	4
MATH 3470 Introductory Probability & Statistics	3
MATH 3810 Complex Variables	3
MATH 4510 Advanced Mathematics for Engineers	3
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective	3
Total	31

Senior Year	sem. hrs.
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHYS 3610 or PHYS 3120 ¹	3
PHYS 3820 Quantum Mechanics	3
PHYS 4130 Computational Physics	3
PHYS 4730 Research Planning	1
PHYS 4740 research	2
Social/Behavioral Sciences Elective	3
Electives	7
Total	28

¹ Both PHYS 3120 and 3610 are required and will be offered in alternate years.

Option II

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
Humanities/Fine Arts Elective.....	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
PHYS 2110 Calculus-based Physics I.....	4
PHYS 1137 Frontiers of Physics.....	1
Total	30

Sophomore Year	sem. hrs.
CSC 1300 Introduction to Problem Solving and Computer Programming.....	4
ENGL 2130, 2235, or 2330.....	3
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations.....	3
PHYS 2120 Calculus-based Physics II.....	4
PHYS 2420 Modern Physics.....	3
PHYS 2920 Mathematical Physics.....	3
PC 2500 Communicating in the Professions.....	3
Science/Engineering ¹	4
Total	31

Junior Year	sem. hrs.
PHYS 3120 or 3610 ²	3
PHYS 3810 Quantum Mechanics I.....	3
PHYS 4610 Classical Electricity & Magnetism I.....	3
PHYS 4620 Classical Electricity & Magnetism II.....	3
PHYS 4711 Advanced Experimental Physics.....	2
MATH 3470 Introductory Probability & Statistics.....	3
MATH 4510 Advanced Mathematics for Engineers.....	3
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Elective.....	3
Science/Engineering Elective ¹	3
Total	29

Senior Year	sem. hrs.
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
PHYS 3610 or PHYS 3120 ¹	3
PHYS 3820 Quantum Mechanics.....	3
PHYS 4730 Research Planning.....	1
PHYS 4740 Research.....	2
Science/Engineering Electives ¹	7
Social/Behavioral Sciences Elective.....	3
Electives.....	5
Total	30

¹ Students in Option II will select an approved program of at least 14 semester hours in other areas of science or engineering. At least 8 of these 14 hours must be in upper division courses.

² Both PHYS 3120 and 3610 are required and will be offered in alternate years.

POLITICAL SCIENCE (POLS)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
POLS 1030 American Government.....	3
POLS 1100 Introduction to Political Science.....	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Social/Behavioral Sciences Elective.....	3
Foreign Language ²	6
MATH 1010 or Any Other General Education Math Course.....	3
Natural Science.....	4
UNIV 1020 First-Year Connections ¹	1
Total	29

Sophomore Year	sem. hrs.
Political Science.....	6
ENGL 2130, 2235, or 2330.....	3
Humanities/Fine Arts Electives.....	6
COMM 2025 or PC 2500.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Natural Science.....	4
Total	28

Junior Year	sem. hrs.
Political Science.....	12
DS 2810 Computer Applications in Business.....	3
ENGL Upper Division Elective.....	3
HIST Upper Division Elective.....	3
POLS 3000 Data Analysis.....	3
Electives.....	9
Total	33

Senior Year	sem. hrs.
Political Science.....	6
HIST Upper Division Elective.....	3
Social Sciences and/or Criminal Justice and/or Philosophy Electives.....	6
Electives.....	15
Total	30

¹ UNIV 1020 or equivalent is required for first time Freshmen. Students not required UNIV 1020 may take a general elective. See your academic advisor.

² Six hours of foreign language in a sequence or three hours foreign language and three hours of culture and people.

LEGAL STUDIES CONCENTRATION

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
POLS 1030 American Government.....	3
POLS 1100 Introduction to Political Science.....	3

Social/Behavioral Sciences Elective.....	3
Foreign Language ²	3
Elective	3
UNIV 1020 First-Year Connections ¹	1
MATH 1010 or Any Other General Education Math Course.....	3
Natural Science	4
Total	29

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330.....	3
COMM 2025 or PC 2500	3
DS 2810 Computer Applications in Business	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Natural Science	4
Humanities/Fine Arts Electives.....	6
Elective	3
Total	28

Junior Year	sem.
	hrs.
CJ 2850, 3000; LAW 2810, 4720; POLS 2250, 3110, 3120, 3130, 3810, 4700 or 4911-4919	6
ENGL Upper Division	3
POLS 3000 Data Analysis.....	3
POLS Upper Division	6
Electives	12
Total	30

Senior Year	sem.
	hrs.
POLS 4100, 4310, 4320, 4730, 4910-4919	6
HIST Upper Division.....	6
POLS Upper Division	6
Electives	15
Total	33

¹ UNIV 1020 or equivalent is required for first time freshmen. Students not required UNIV 1020 may take a general elective. See your academic advisor.

² Three hours of Foreign Language (not to include the Culture and Civilization courses).

A total of 120 hours is required for graduation with a minimum of 36 hours at the upper division level.

Student should apply for graduation at least two semesters prior to expected graduation date.

PSYCHOLOGY (PSY)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem.
	hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
PSY 1030 Introduction to Psychology	3
BIOL 1010 Introduction to Biology I.....	4
BIOL 1020 Diversity of Life.....	4
MATH 1530 or 1130	3
COMM 2025 or PC 2500	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3

UNIV 1020 First-Year Connections ¹	1
Total	30

Sophomore Year	sem.
	hrs.
ENGL 2130, 2235, or 2330	3
Social/Behavioral Sciences Elective	3
Humanities/Fine Arts Electives.....	6
PSY 2130 or 3300.....	3
PSY Upper Division Elective	3
Electives.....	12-13
Total	30-31

Junior Year	sem.
	hrs.
PSY 3010 Statistics & Experimental Design	3
PSY 3020 Information Literacy in Psychology	3
PSY 3110 Experimental Psychology.....	4
PSY 4050 Learning & Cognition.....	3
PSY 4130 Brain and Behavior	3
PSY 4150 or 4160	3
Electives.....	12
Total	31

Senior Year	sem.
	hrs.
PSY 4930 Senior Thesis	3
PSY 4931 Senior Thesis	3
PSY Upper Division Electives	9
Electives.....	14
Total	29

¹UNIV 1020 or equivalent is required for first time Freshman. Students not required to take UNIV 1020 may take a general elective (it does not have to be a one-hour course). See your academic advisor.

SECONDARY EDUCATION (SEED)

(Leading to the Bachelor of Science Degree, Non-Licensure)

Freshman Year	sem.
	hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology..	2
FOED 1820 or 1822	1
MATH	3
Science Sequence	8
Social/Behavioral Sciences Elective	3
Humanities/Fine Arts Elective	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Total	32

Sophomore Year	sem.
	hrs.
Social/Behavioral Sciences Elective	3
Humanities/Fine Arts Elective ¹	6
COMM 2025 or PC 2500.....	3
Content Electives-Any: BIOL, CHEM, ECON, ENGL, GEOG, HIST, MATH, POLS	12
Electives.....	4
Total	28

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
READ 3350 Teaching Reading in the Content Areas	3
Content Electives-Any: BIOL, CHEM, ECON, ENGL, GEOG, HIST, MATH, POLS, READ, SEED	15
Upper Division Electives.....	4
SEED 4120, 4122, 4123 or 4124.....	3
Total	28

Senior Year	sem. hrs.
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Upper Division Content Electives ² -Any: BIOL, CHEM, ECON, ENGL, GEOG, GEOL, HIST, MATH, PHYS, POLS, READ, SEED	15
Upper Division Electives.....	5
Electives	9
Total	32

¹ At least one course in Humanities/Fine Arts must be in Literature (ENGL 2130, 2235 or 2330.)

² Overall, the program must include at least 36 hours of upper division coursework.

ENGLISH (SEEN)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH	3
Humanities/Fine Arts Electives.....	6
Natural Science	8
FOED 2011 Introduction to Teaching & Technology.....	2
FOED 1820 or 1822	1
COMM 2025 or PC 2500.....	3
Elective.....	1
Total	30

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology.....	3
ENGL 2330 Topics in World Literature	3
ENGL 3810 British Literature I.....	3
ENGL 3820 British Literature II.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
FREN/GERM/SPAN 2010, 2020 ¹	6
Social/Behavioral Sciences Electives.....	6
Total	30

Junior Year	sem. hrs.
ENGL 3250 or Any Upper Division English Writing Course, Linguistics, Grammar, or History of English Language	3
ENGL 3910 American Literature I	3

ENGL 3920 American Literature II	3
ENGL 4121 Shakespeare	3
ENGL 4751, 4712, 4713 or ENGL 4700.....	3
ESLP 4100 or TEAE 4020	3
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3820 Field Experiences in Education	2
READ 3350 Teaching Reading in the Content Area	3
READ 4411 The Reading-Writing Connection: Secondary.....	3
READ 4570 Young Adult Literature.....	3
SEED 4120 Materials & Methods of Teaching English	3
Total	35

Senior Year	sem. hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	25

¹ Those students who do not place at the 2010 level as determined by a proficiency test administered by the Department of Foreign Languages or those who have not had taken two years of foreign language in high school will take 1010, 1020 and 2010 for nine hours in the same language.

FRENCH (SEFR)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FREN 2010 Transition to Intermediate French.....	3
FREN 2020 Intermediate French	3
FOED 2011 Introduction to Teaching & Technology	2
FOED 1820 or 1822.....	1
ART 1035 or MUS 1030.....	3
Science Sequence	8
COMM 2025 or PC 2500.....	3
MATH.....	3
Total	32

Sophomore Year	sem. hrs.
ENGL 2130 or 2235	3
ENGL 2330 Topics in World Literature.....	3
EDPY 2210 Educational Psychology	3
FREN 3010 Written Communication in French	3
FREN 3020 Oral Communication in French.....	3
FREN 3100 French Phonetics.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Social/Behavioral Sciences Electives.....	6
Total	30

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3800 Field Experiences in Education	1
FREN 3112 Culture and Civilization of France	3
FREN Upper Division	6
FREN 3110 or FREN 3120	3
Choose 6 hours from the following: HIST 4550, HIST Upper Division; SPAN 1010, 1020; GERM 1010, 1020	6
READ 3350 Teaching Reading in the Content Area	3
SEED 4125 Materials & Methods of Teaching Foreign Language	3
Electives	3
Total	31

Senior Year	sem. hrs.
FREN 4925 Teaching Licensure Senior Capstone.....	2
SEED 4871 Residency I	5
SEED 4872 Professional Seminar I	5
SEED 4881 Residency II	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	27

GERMAN (SEGE)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
ART 1035 or MUS 1030	3
GERM 2010 Transition to Intermediate German	3
GERM 2020 Intermediate German	3
FOED 2011 Introduction to Teaching & Technology	2
FOED 1820 or 1822	1
Science Sequence	8
COMM 2025 or PC 2500	3
MATH	3
Total	32

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2130 or 2235	3
ENGL 2330 Topics in World Literature	3
GERM 3010 Written Communication in German	3
GERM 3020 Oral Communication in German	3
GERM 3200 Business German	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Social/Behavioral Sciences Electives	6
Total	30

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3

FOED 3800 Field Experiences in Education	1
GERM 3112 German Civilization and Culture	3
GERM 3150 Introduction to German Literature	3
Choose 6 hours from the following: HIST 4530, 4540, 4550, 4560, 4570; GERM Upper Division; FREN 1010, 1020; SPAN 1010, 1020	6
Any Upper Division German Elective	9
READ 3350 Teaching Reading in the Content Areas	3
SEED 4125 Materials & Methods of Teaching Foreign Language	3
Total	31

Senior Year	sem. hrs.
GERM 4925 Teaching Licensure Senior Capstone.....	2
SEED 4871 Residency I	5
SEED 4872 Professional Seminar I	5
SEED 4881 Residency II	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	27

SPANISH (SESP)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
ART 1035 or MUS 1030	3
MATH	3
Science Sequence	8
SPAN 2010 Transition to Intermediate Spanish	3
SPAN 2020 Intermediate Spanish	3
COMM 2025 or PC 2500	3
Total	32

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2130 or 2235	3
ENGL 2330 Topics in World Literature	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Social/Behavioral Sciences Electives	6
SPAN 3010 Written Communication in Spanish ¹	3
SPAN 3020 Oral Communication in Spanish	3
SPAN 4010 or 4020	3
Total	30

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3800 Field Experiences in Education	1
READ 3350 Teaching Reading in the Content Areas	3
Choose 3 hours from one of the following that has not already been taken: SPAN 4010, 4020, 4110, 4120	3

Choose 6 hours from the following: HIST 3710,
HIST 4790-4799, Any Approved Upper Division
HIST; Any Upper Division SPAN; FREN 1010, 1020;
GERM 1010, 1020.....6

SEED 4125 Materials & Methods of Teaching Foreign Language	3
SPAN Upper Division Courses	6
SPAN 4110 or 4120	3
SPAN 4810 Special Topics in Spanish.....	3
Total	31

Senior Year	sem. hrs.
SPAN 4925 Teaching Licensure Senior Capstone.....	2
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II.....	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	27

- 1 SPAN 3010 is a prerequisite to all Upper Division Spanish language courses.
- 2 If SPAN 4010 and 4020 have been previously completed, another Upper Division Spanish course should be substituted for SPAN 3510 or 3550.
- 3 SPAN 4010 and 4110 are offered Fall term in alternate years. SPAN 4020 and 4120 are offered Spring term in alternate years. Choose the course offered that term.

MATHEMATICS (SEMA)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
PHED Activity	1
Science Sequence	8
Social/Behavioral Sciences Elective.....	3
Total	29

Sophomore Year	sem. hrs.
Humanities/Fine Arts Elective.....	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or ENGL 2330	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH 2010 Introduction to Linear Algebra	3
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations	3
COMM 2025 or PC 2500	3
Social/Behavioral Sciences Elective.....	3
Total	31

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
MATH 3070 Statistical Methods I.....	3
MATH 3400 Introduction to Concepts of Mathematics.....	3
MATH 3430 College Geometry	3
MATH 4010, 4050, 4350, or 4360	3
MATH 4210 Numerical Analysis I.....	3
MATH 4610 or 4620.....	3
READ 3350 Teaching Reading in the Content Areas	3
SEED 4122 Materials & Methods of Teaching Mathematics.....	3
SEED 4422 Teaching Secondary Mathematics using Technology	3
Total	32

Senior Year	sem. hrs.
SEED 4322 Teaching Algebra in Middle/High School	3
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	28

BIOLOGY (SCBI)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
GEOL 1040 Physical Geology.....	4
MATH 1530 Introductory Statistics.....	3
Humanities/Fine Arts Elective	3
COMM 2025 or PC 2500.....	3
Total	30

Sophomore Year	sem. hrs.
BIOL 2310 General Botany	4
Social/Behavioral Sciences Electives.....	6
CHEM 1110 General Chemistry I.....	4
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
EDPY 2210 Educational Psychology	3
Elective	1
Total	30

Junior Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 3130 General Ecology.....	4
BIOL 3140 Cellular Biology.....	4
BIOL 3810 General Genetics.....	4
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3820 Field Experiences in Education.....	2
MATH 1710 Pre-calculus Algebra.....	3
PHYS 2010 Algebra-based Physics I.....	4
READ 3350 Teaching Reading in the Content Areas.....	3
SEED 4123 Materials & Methods of Teaching the Sciences.....	3
Elective.....	1
Total	35

Senior Year	sem. hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II.....	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	25

CHEMISTRY (SCCH)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology..	2
FOED 1820 or 1822.....	1
GEOL 1040 Physical Geology.....	4
MATH 1530 Introductory Statistics.....	3
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
COMM 2025 or PC 2500.....	3
Humanities/Fine Arts Elective.....	3
Total	30

Sophomore Year	sem. hrs.
ASTR 1010, 1020 or 1030.....	4
BIOL 1010 Introduction to Biology I.....	4
BIOL 1020 Diversity of Life.....	4
EDPY 2210 Educational Psychology.....	3
ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or 2330.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Social/Behavioral Sciences Elective.....	3
Total	30

Junior Year	sem. hrs.
CHEM 3005 or 3010.....	4
CHEM 3410 Quantitative Analysis.....	4
CHEM 3500 Elements of Physical Chemistry.....	3

FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3820 Field Experiences in Education.....	2
MATH 1710 Pre-calculus Algebra.....	3
MATH 1830 Applied Calculus.....	3
PHYS 2010 Algebra-based Physics I.....	4
READ 3350 Teaching Reading in the Content Areas.....	3
SEED 4123 Materials & Methods of Teaching the Sciences.....	3
Social/Behavioral Sciences Elective.....	3
Total	35

Senior Year	sem. hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II.....	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	25

EARTH SCIENCE (SCEA)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
BIOL 1010 Introduction to Biology.....	4
BIOL 1020 Diversity of Life.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology..	2
FOED 1820 or 1822.....	1
MATH 1530 Introductory Statistics.....	3
Humanities/Fine Arts Elective.....	3
Social/Behavioral Sciences Elective.....	3
Total	26

Sophomore Year	sem. hrs.
ASTR 1010, 1020 or 1030.....	4
EDPY 2210 Educational Psychology.....	3
ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or 2330.....	3
GEOL 1040 Physical Geology.....	4
GEOL 1045 Earth Environment, Resources & Society.....	4
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
COMM 2025 or PC 2500.....	3
Social/Behavioral Sciences Elective.....	3
Total	33

Junior Year	sem. hrs.
BIOL 3130 General Ecology.....	4
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3820 Field Experiences in Education.....	2
GEOL 3230 Structural Geology and Tectonics.....	4
GEOL 3410 Paleontology or other 3000 course.....	4
GEOL 4150 Geomorphology.....	4
GEOL Upper Division Elective.....	3

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MATH 1710 Pre-calculus I.....	3
MATH 1830 Applied Calculus.....	3
READ 3350 Teaching Reading in the Content Areas	3
SEED 4123 Materials & Methods of Teaching the Sciences.....	3
Total	36

Senior Year	sem. hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II.....	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	25

PHYSICS (SCPH)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
CHEM 1110 General Chemistry I.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
HIST 1310 Science and World Cultures.....	3
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
PHYS 2110 Calculus-based Physics I.....	4
Social/Behavioral Sciences Elective.....	3
Total	31

Sophomore Year	sem. hrs.
ENGL 2130 Topics in American Literature	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Humanities/Fine Arts Elective.....	3
MATH 2110 Calculus III.....	4
MATH 2120 Differential Equations	3
PHYS 2120 Calculus-based Physics II.....	4
PHYS 2420 Modern Physics	3
PHYS 2920 Mathematical Physics	3
Total	29

Junior Year	sem. hrs.
BIOL 1080 Concepts of Biology	3
Social/Behavioral Sciences Elective.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
EDPY 2210 Educational Psychology.....	3
GEOL 1070 Concepts of Geology.....	3
PHYS 1903 Special Topics in Physics and Physics Education	3
PHYS 3120 Statistical Thermal Physics.....	3
PHYS 3610 or 4903	3
READ 3350 Teaching Reading in the Content Areas.....	3
SEED 4123 Materials & Methods of Teaching the	

Sciences	3
COMM 2025 or PC 2500.....	3
Total	35

Senior Year	sem. hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	25

ECONOMICS (SSEC)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology	2
FOED 1820 or 1822	1
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Elective	1
POLS 1030 American Government.....	3
Science Sequence	8
MATH	3
Total	30

Sophomore Year	sem. hrs.
ANTH 1100 or SOC 1010	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
ECON 2020 Principles of Macroeconomics	3
EDPY 2210 Educational Psychology	3
GEOG 1012 Cultural Geography	3
HIST 2210 Early Western Civilization	3
HIST 2220 Modern Western Civilization	3
PSY 1030 Introduction to Psychology	3
COMM 2025 or PC 2500.....	3
Total	30

Junior Year	sem. hrs.
ECON Elective	3
ECON 2010 Principles of Microeconomics	3
ECON 4510 International Trade & Finance.....	3
ECON 4530 History of Economic Thought.....	3
ECON upper-division elective	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
HIST 2310 or 2320.....	3
HIST 3100 Tennessee Topics.....	3
HIST 4710, 4730, 4740, 4750, 4760 or 4790-4799	3
READ 3350 Teaching Reading in the Content Areas	3
SEED 4124 Materials & Methods of Teaching Social Studies	3
Total	35

Senior Year	sem.
	hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II.....	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
Total	25

GEOGRAPHY (SSGE)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem.
	hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Elective.....	1
POLS 1030 American Government.....	3
Science Sequence	8
MATH	3
Total	30

Sophomore Year	sem.
	hrs.
ANTH 1100 or SOC 1010.....	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
HIST 2210 Early Western Civilization.....	3
HIST 2220 Modern Western Civilization.....	3
HIST 2310 or 2320	3
PSY 1030 Introduction to Psychology	3
EDPY 2210 Educational Psychology.....	3
GEOG 1012 Cultural Geography.....	3
COMM 2025 or PC 2500.....	3
Total	30

Junior Year	sem.
	hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
GEOG Elective	3
GEOG 1010 Weather and Climate	3
GEOG 3010 Geography of the United States.....	3
GEOG 4210 Cartography.....	3
GEOG Upper Division Elective.....	3
HIST 3100 Tennessee Topics	3
HIST 3410 Introduction to Historical Methods	3
HIST 4710, 4730, 4740, 4750, 4760 or 4790-4799	3
READ 3350 Teaching Reading in the Content Areas	3
SEED 4124 Materials & Methods of Teaching Social Studies	3
Total	35

Senior Year	sem.
	hrs.
SEED 4871 Residency I.....	5

SEED 4872 Professional Seminar I	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	25

HISTORY (SSHI)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem.
	hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
Elective	1
POLS 1030 American Government.....	3
Science Sequence	8
MATH	3
Total	30

Sophomore Year	sem.
	hrs.
ANTH 1100 or SOC 1010	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
EDPY 2210 Educational Psychology	3
GEOG 1012 Cultural Geography	3
HIST 2210 Early Western Civilization	3
HIST 2220 Modern Western Civilization	3
HIST 2310 or 2320.....	3
PSY 1030 Introduction to Psychology	3
COMM 2025 or PC 2500.....	3
Total	30

Junior Year	sem.
	hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
HIST 3100 Tennessee Topics.....	3
HIST 3410 Introduction to Historical Methods.....	3
HIST 4710, 4730, 4740, 4750, 4760, or 4790-4799.....	3
HIST Upper Division Electives	6
READ 3350 Teaching Reading in the Content Areas	3
SEED 4124 Materials & Methods of Teaching Social Studies	3
Electives from POLS, ECON, GEOG	6
Elective	3
Total	35

Senior Year	sem.
	hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	25

POLITICAL SCIENCE (SSPS)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
Elective.....	1
POLS 1030 American Government	3
Science Sequence	8
MATH	3
Total	30

Sophomore Year	sem. hrs.
ANTH 1100 or SOC 1010.....	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
PSY 1030 Introduction to Psychology	3
ECON 2020 Principles of Macroeconomics.....	3
EDPY 2210 Educational Psychology.....	3
GEOG 1012 Cultural Geography.....	3
HIST 2210 Early Western Civilization.....	3
HIST 2220 Modern Western Civilization.....	3
COMM 2025 or PC 2500.....	3
Total	30

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
HIST 2310 or 2320	3
HIST 3100 Tennessee Topics	3
HIST 4710, 4730, 4740, 4750, 4760 or 4790-4799	3
POLS 3310 or 3320 or 3610 or 4960	3
POLS 3330 State and Local Government	3
POLS 3810 or POLI 4350.....	3
POLS 4510 Comparative Government: Europe	3
POLS Elective	3
READ 3350 Teaching Reading in the Content Areas	3
SEED 4124 Materials & Methods of Teaching Social Studies	3
Total	35

Senior Year	sem. hrs.
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom.....	3
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I.....	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II.....	2
Total	25

SPEECH COMMUNICATION AND THEATRE (SEST)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
MATH 1010 Math for General Studies or any approved general education math	3
Science Sequence	8
FREN/GERM/SPAN 2010, 2020 ¹	6
ART 1035 or MUS 1030	3
THEA 1030 Introduction to Theatre.....	3
Total	32

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2330 Topics in World Literature.....	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
COMM 2025 Fundamentals of Communication	3
Social/Behavioral Science Electives	6
THEA 2015 Acting II.....	3
THEA 2110 Play Production	1
THEA Electives	3
Total	28

Junior Year	sem. hrs.
CUED 4120 or SEED 4120	3
ENGL 3910 or 3920	3
ENGL 4121 Shakespeare	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
READ 3350 Teaching Reading in the Content Areas	3
COMM 3130 Speech Activities.....	3
COMM 3630 Discussion & Parliamentary Procedure	3
COMM 4430 Advanced Interpersonal Communication	3
THEA 2025 Stagecraft II	3
THEA 4300 Play Directing	3
THEA 4500 Creative Dramatics	3
Total	35

Senior Year	sem. hrs.
SEED 4871 Residency I.....	5
SEED 4872 Professional Seminar I	5
SEED 4881 Residency II.....	10
SEED 4882 Professional Seminar II	2
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom	3
Total	25

¹ Those students who do not place at the 2010 level as determined by a proficiency test administered by the Department of Foreign Languages or those students who have not taken two years of foreign language in

high school will take 1010, 1020, and 2010 for nine hours in the same language.

SOCIOLOGY (SOC)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
UNIV 1020 First-Year Connections ³	1
SOC 1010 Introduction to Sociology	3
Humanities/Fine Arts Elective.....	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH ¹	3
Natural Science.....	8
Foreign Language ²	3
SOC/SW/CJ Elective.....	3
Total	30

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
SOC 3100 Sociological Theory	3
SOC/SW/CJ Elective	3
Social/Behavioral Sciences Elective.....	3
COMM 2025 or PC 2500.....	3
Elective.....	3
Humanities/Fine Arts Elective.....	3
Social Science/Philosophy Elective.....	3
Total	30

Junior Year	sem. hrs.
SOC 3900 Introduction to Social Research.....	3
SOC 3910 Social Science Statistical Analysis.....	3
SOC/SW/CJ Upper Division Electives.....	9
Social Science/Philosophy Elective.....	3
Electives.....	12
Total	30

Senior Year	sem. hrs.
SOC 4920 or 4930	3
SOC/SW/CJ Upper Division Electives.....	6
Social Science/Philosophy Elective.....	3
Electives.....	18
Total	30

- ¹ Any general education Mathematics course. MATH 1010 Math for General Studies recommended.
- ² The minimum is a course in a specific language. None of the "Country and the People" courses are acceptable.
- ³ UNIV 1020 or equivalent is required for first time Freshmen. Students not required to take UNIV 1020 may take a general elective. See your academic advisor.
- A total of 120 hours is required for graduation with a minimum of 36 hours of Upper Division coursework.

CRIMINAL JUSTICE CONCENTRATION (SOCJ)

(Leading to the Bachelor of Science Degree in Sociology with a Concentration in Criminal Justice)

Freshman Year	sem. hrs.
UNIV 1020 First-Year Connections ³	1
SOC 1010 Introduction to Sociology	3
CJ 2700 Introduction to Law Enforcement	3
CJ 2850 Criminal Law & Procedure	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Humanities/Fine Arts Elective	3
MATH ¹	3
Foreign Language ²	3
POLS 1030 American Government.....	3
Social Science/Philosophy Elective.....	3
Total	31

Sophomore Year	sem. hrs.
CJ 2660 Criminology.....	3
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
CJ 3650 Juvenile Delinquency	3
SOC 3100 Sociological Theory	3
COMM 2025 or PC 2500.....	3
Natural Science.....	8
PHIL 1030 Introduction to Philosophy	3
Total	32

Junior Year	sem. hrs.
SOC 3900 Introduction to Social Research.....	3
SOC 3910 Social Science Statistical Analysis	3
SOC/SW/CJ Upper Division Electives.....	6
CJ 3610 Advanced Criminal Procedure	3
Social Science/Philosophy Elective.....	3
Electives.....	12
Total	30

Senior Year	sem. hrs.
SOC 4920 or 4930	3
SOC/SW/CJ Upper Division Electives.....	6
CJ 4660 Corrections	3
Social Science/Philosophy Upper Division Elective ...	3
Electives.....	12
Total	27

- ¹ Any general education Mathematics course. MATH 1010 Math for General Studies recommended.
- ² The minimum is a course in a specific language. None of the "Country and the People" courses are acceptable.
- ³ UNIV 1020 or equivalent is required for first time Freshmen. Students not required to take UNIV 1020 may take a general elective. See your academic advisor.
- A total of 120 hours is required for graduation with a minimum of 36 hours of Upper Division coursework.

SOCIAL WORK CONCENTRATION (SOSW)**(Leading to the Bachelor of Science Degree in Sociology with a concentration in Social Work)**

Freshman Year	sem. hrs.
UNIV 1020 First-Year Connections ³	1
SOC 1010 Introduction to Sociology	3
SW 1800 Introduction to Social Work	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH ¹	3
Natural Science	8
SOC/SW/CJ Elective	3
Foreign Language ²	3
Total	30

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
SOC 3100 Sociological Theory	3
SOC/SW/CJ Elective	3
PSY 1030 Introduction to Psychology	3
COMM 2025 or PC 2500	3
Humanities/Fine Arts Electives	6
Elective	3
Total	30

Junior Year	sem. hrs.
SOC 3900 Introduction to Social Research	3
SW 4100 Probation & Parole	3
SOC 3910 Social Science Statistical Analysis	3
SOC/SW/CJ Upper Division Electives	6
POLS 1030 American Government	3
PSY Course or EDPY 2210	3
Electives	9
Total	30

Senior Year	sem. hrs.
SOC 4920 or 4930	3
SW 4120 Case Management	3
SW 4900 Internship	3
PHIL 2250 Introductory Ethics	3
SOC/SW/CJ Upper Division Elective	3
Electives	15
Total	30

¹ Any general education Mathematics course. MATH 1010 Math for General Studies recommended.

² The minimum is a course in a specific language. None of the "Country and the People" courses are acceptable.

³ UNIV 1020 or equivalent is required for first time Freshmen. Students not required to take UNIV 1020 may take a general elective. See your academic advisor.

A total of 120 hours is required for graduation with a minimum of 36 hours of Upper Division coursework.

SPECIAL EDUCATION (SPE)**COMPREHENSIVE PROGRAM (SPEC)****(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)**

Freshman Year	sem. hrs.
BIOL 1080 Concepts of Biology	3
CHEM 1310 Concepts of Chemistry	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
GEOG 1012 Cultural Geography	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
Total	30

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
GEOL 1070 Concepts of Geology	3
HEC 3500 Development: Middle Childhood/Adolescence	3
Humanities/Fine Arts Elective	3
MATH	3
PHYS 1310 Concepts of Physics	3
Social/Behavioral Sciences Elective	3
SPED 2010 Introduction to Special Education	3
Total	30

Junior Year	sem. hrs.
COMM 2025 or PC 2500	3
CUED 4700 Educational Data and Assessment	2
EXPW 4520 Adapted Physical Activity and Sport	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3810 Field Experiences in Education	2
MUS 1074 Music to Meet Exceptional Education Needs	1
READ 3313 Literacy for Special Populations	5
SPED 3020 Characteristics & Needs of Persons with Comprehensive Disabilities	3
SPED 3031 Physical Management & Support Services for Orthopedic, Motor & Health Impaired	3
SPED 3050 Universal Design for Special Education ..	5
SPED 4030 Applied Behavior Analysis for Teachers	3
SPED 4200 Students with Autism Spectrum Disorders	3
Total	36

Senior Year	sem. hrs.
CFS 3600 Family, Community & Professional Practice Partnerships	2
SPED 4871 Residency I	5
SPED 4872 Professional Seminar I	5
SPED 4881 Residency II	10
SPED 4882 Professional Seminar II	2
Total	24

Non-Licensure (SPNL)

(Leading to the Bachelor of Science Degree)

Freshman Year	sem. hrs.
BIOL 1080 Concepts of Biology	3
CHEM 1310 Concepts of Chemistry	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
GEOG 1012 Cultural Geography	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
Total	30

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
GEOG 1070 Concepts of Geology	3
HEC 2200 or 3500	3
Humanities/Fine Arts Elective	3
PHYS 1310 Concepts of Physics	3
Social/Behavioral Sciences Elective	3
SPED 2010 Introduction to Special Education	3
COMM 2025 or PC 2500	3
Total	30

Junior Year	sem. hrs.
EXPW 2150 Human Sexuality	3
EXPW 2430 First Aid, Safety and CPR	2
EXPW 4520 Adapted Physical Activity and Sport	3
SPED 3020 Characteristics and Needs of Persons with Comprehensive Disabilities	3
SPED 3031 Physical Management & Support Services for Orthopedic, Motor & Health Impaired	3
SPED 3110 Behavior Concepts	3
SPED 3120 Interventions and Supports	3
SPED 4200 Teaching Students with Autism Spectrum Disorders	3
Electives	9
MATH Elective	3
Total	35

Senior Year	sem. hrs.
CFS 3600 Family, Community & Professional Practice Partnerships	2
SPED 4110 Behavioral Assessment	3
SPED 4120 Topics in Behavior	3
SPED 4170 Community Residency/Practicum I	7

SPED 4180 Community Residency/Practicum II	9
Elective	1
Total	25

SE Interventionist Biology, 6-12 (SPBI)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
CHEM 1310 Concepts of Chemistry	3
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
GEOG 1070 Concepts of Geology	3
Humanities/Fine Arts Elective	3
MATH 1530 Introductory Statistics	3
MATH 1710 Pre-calculus I	3
COMM 2025 or PC 2500	3
Total	31

Sophomore Year	sem. hrs.
BIOL 1123 General Biology II	4
EDPY 2210 Educational Psychology	3
ENGL 2130 Topics in American Literature	3
ENGL 2235 or 2330	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
PHYS 1310 Concepts of Physics	3
SPED 2010 Introduction to Special Education	3
Social/Behavioral Sciences Electives	6
Total	31

Junior Year	sem. hrs.
BIOL 2350 Introductory Anatomy and Physiology	4
BIOL 3130 General Ecology	4
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
READ 3350 Teaching Reading in the Content Areas ..	3
SEED 4123 Materials and Methods of Teaching the Sciences	3
SPED 3030 The Education of Persons with Learning Disabilities	3
SPED 3050 Universal Design for Special Education ..	5
SPED 4030 Applied Behavior Analysis for Teachers	3
SPED 4200 Teaching Students with Autism Spectrum Disorders	3
Total	33

Senior Year	sem. hrs.
SPED 4100 Collaboration and Inclusive Practice	3
SPED 4871 Residency I	5
SPED 4872 Professional Seminar I	5
SPED 4881 Residency II	10
SPED 4892 Professional Seminar II	2
Total	25

SE Interventionist English, 6-12 (SPEN)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
MUS 1074 Music to Meet Exceptional Education Needs.....	1
MATH	3
Science Sequence	8
Humanities/Fine Arts Electives.....	6
COMM 2025 or PC 2500	3
Total	30

Sophomore Year	sem. hrs.
ENGL 2130 Topics in American Literature	3
ENGL 2235 British Literature.....	3
ENGL 2330 Topics in World Literature.....	3
EDPY 2210 Educational Psychology.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
SPED 2010 Introduction to Special Education	3
Social/Behavioral Sciences Electives.....	6
FREN, GERM or SPAN 2010	3
Total	30

Junior Year	sem. hrs.
ENGL 3250 or Any Upper Division English Writing Course, Linguistics, Grammar, or History of the English Language	3
ESLP 4100 or TEAE 4020.....	3
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3820 Field Experiences in Education	2
READ 3350 Teaching Reading in the Content Areas..	3
READ 4411 The Reading-Writing Connection: Secondary	3
READ 4570 Young Adult Literature	3
SEED 4120 Materials and Methods of Teaching English	3
SPED 3030 The Education of Persons with Learning Disabilities	3
SPED 3050 Universal Design for Special Education..	5
SPED 4030 Applied Behavior Analysis for Teachers ..	3
Elective.....	1
Total	35

Senior Year	sem. hrs.
SPED 4100 Collaboration and Inclusive Practice.....	3
SPED 4871 Residency I	5
SPED 4872 Professional Seminar I.....	5
SPED 4881 Residency II.....	10
SPED 4892 Professional Seminar II.....	2
Total	25

SE Interventionist K-8, (SPK8)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
BIOL 1080 Concepts of Biology and Environment	3
CHEM 1310 Concepts of Chemistry	3
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
GEOG 1012 Cultural Geography	3
HIST 2010 Early United States History	3
HIST 2020 Modern United States History	3
MATH 1410 Number Concepts for Teachers	3
MATH 1420 Geometry Concepts for Teachers	3
FOED 2011 Introduction to Teaching & Technology ..	2
FOED 1820 or 1822	1
Total	30

Sophomore Year	sem. hrs.
EDPY 2210 Educational Psychology	3
ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or ENGL 2330	3
GEOL 1070 Concepts of Geology.....	3
HEC 3500 Development: Middle Childhood/Adolescence.....	3
MATH 1130 or 1530.....	3
PHYS 1310 Concepts of Physics	3
SPED 2010 Introduction to Special Education	3
Social/Behavioral Sciences Elective	3
Humanities/Fine Arts Elective	3
Total	30

Junior Year	sem. hrs.
COMM 2025 or PC 2500.....	3
CUED 4700 Educational Data and Assessment	2
FOED 3010 Integrating Instructional Technology into the Classroom	3
FOED 3810 Field Experiences in Education	2
MUS 1074 Music to Meet Exceptional Education Needs	1
READ 3313 Literacy for Special Populations	5
SPED 3030 The Education of Persons with Learning Disabilities.....	3
SPED 3031 Physical Management and Support Services for Orthopedic, Motor and Health Impaired.....	3
SPED 3050 Universal Design for Special Education..	5
SPED 4030 Applied Behavior Analysis for Teachers ..	3
SPED 4200 Teaching Students with Autism Spectrum Disorders	3
Total	33

Senior Year	sem. hrs.
CFS 3600 Family, Community & Professional Partners.....	2
SPED 4100 Collaboration and Inclusive Practice.....	3
SPED 4871 Residency I.....	5
SPED 4872 Professional Seminar I.....	5
SPED 4881 Residency II.....	10
SPED 4892 Professional Seminar II.....	2
Total	27

SE Interventionist Math, 6-12, (SPMA)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology..	2
FOED 1820 or 1822.....	1
MATH 1910 Calculus I.....	4
MATH 1920 Calculus II.....	4
PHED Activity.....	1
Science Sequence.....	8
Social/Behavioral Science Elective.....	3
Total	30

Sophomore Year	sem. hrs.
ART 1035 or MUS 1030.....	3
ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or ENGL 2330.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH 1530 Introductory Statistics.....	3
MATH 2110 Calculus III.....	3
COMM 2025 or PC 2500.....	3
SPED 2010 Introduction to Special Education.....	3
Social/Behavioral Science Elective.....	3
Total	31

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3820 Field Experiences in Education.....	2
MATH 2010 Introduction to Linear Algebra.....	3
READ 3350 Teaching Reading in the Content Areas..	3
SEED 4122 Materials and Methods of Teaching Mathematics.....	3
SPED 3030 The Education of Persons with Learning Disabilities.....	3
SPED 3050 Universal Design for Special Education..	5
SPED 4030 Applied Behavior Analysis for Teachers..	3
SPED 4200 Teaching Students with Autism Spectrum Disorders.....	3
SPED 4422 Teaching Secondary Mathematics Using Technology.....	3
Total	31

Senior Year	sem. hrs.
SEED 4322 Teaching Algebra in Middle/High School.....	3

SPED 4100 Collaboration and Inclusive Practice	3
SPED 4871 Residency I.....	5
SPED 4872 Professional Seminar I.....	5
SPED 4881 Residency II.....	10
SPED 4892 Professional Seminar II.....	2
Total	28

SE Interventionist Social Studies/History 6-12, (SPHI)

(Leading to the Bachelor of Science Degree and Tennessee teaching license if Teacher Education requirements are met.)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
FOED 2011 Introduction to Teaching & Technology..	2
FOED 1820 or 1822.....	1
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
POLS 1030 American Government.....	3
MATH.....	3
Science Sequence.....	8
Elective.....	1
Total	30

Sophomore Year	sem. hrs.
ANTH 1100 Introduction to Anthropology.....	3
EDPY 2210 Educational Psychology.....	3
ENGL 2130 Topics in American Literature.....	3
ENGL 2235 or ENGL 2330.....	3
HIST 2210 Early Western Civilization.....	3
HIST 2220 Modern Western Civilization.....	3
HIST 2310 or 2320.....	3
PSY 1030 Introduction to Psychology.....	3
COMM 2025 or PC 2500.....	3
SPED 2010 Introduction to Special Education.....	3
Total	30

Junior Year	sem. hrs.
FOED 3010 Integrating Instructional Technology into the Classroom.....	3
FOED 3820 Field Experiences in Education.....	2
HIST 3100 Tennessee Topics.....	3
HIST 3410 Introduction to Historical Methods.....	3
READ 3350 Teaching Reading in the Content Areas..	3
SEED 4124 Materials and Methods of Teaching Social Studies.....	3
SPED 3030 The Education of Persons with Learning Disabilities.....	3
SPED 3050 Universal Design for Special Education..	5
SPED 4030 Applied Behavior Analysis for Teachers..	3
Electives from POLS, ECON, GEOG Electives.....	4
HIST 4710, 4730, 4740, 4750, 4760, 4790-4799.....	3
Total	35

Senior Year	sem. hrs.
SPED 4100 Collaboration and Inclusive Practice	3
SPED 4871 Residency I.....	5
SPED 4872 Professional Seminar I.....	5
SPED 4881 Residency II.....	10
SPED 4892 Professional Seminar II.....	2
Total	25

WILDLIFE AND FISHERIES SCIENCE (WFS)**CONSERVATION BIOLOGY CONCENTRATION (WFSC)****(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods.....	1
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
BIOL 2310 General Botany.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
CHEM 1010, 1020 or CHEM 1110, 1120.....	8
MATH ¹	<u>6</u>
Total	33

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
GEOL 1040 Physical Geology.....	4
GEOL 2000 Earth Evolution & Life History.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH ¹	3
Humanities/Fine Arts Electives.....	6
PC 2500 or COMM 2025.....	<u>3</u>
Total	28

Junior Year	sem. hrs.
BIOL 3240 Field Botany.....	3
BIOL 3810 General Genetics.....	4
BIOL 3920 Biological Communication Skills.....	3
BIOL 4330 Plant Ecology.....	3
BIOL 3330 or 4610.....	3
WFS 3130 General Ecology.....	4
WFS 4500 National Wildlife Policy.....	3
WFS 4740 Wildlife Principles.....	2
Science Directed Electives ²	<u>6-10</u>
Total	31-35

Senior Year	sem. hrs.
WFS 4700 Habitat Management.....	3
WFS 4711 Fisheries Management.....	3
WFS 4730 Conservation Biology.....	3
WFS 4630 or 4820.....	3
WFS 4810 or 4830.....	3
Social/Behavioral Sciences Electives.....	6
Electives.....	<u>3-7</u>
Total	24-28

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

² Choose two courses from AGHT 3450, AGRN 2300 plus AGRN 2310 (both must be taken concurrently and count as a single course for this requirement), BIOL 3530, BIOL 4320 (5320), BIOL 4840 (5840), WFS 4770 (5770), and GEOG 4410 (5410) or GEOG 4510 (5510) or WFS 4870 (5870) (only one of these final three courses will

count toward this requirement.)

FISHERIES SCIENCE CONCENTRATION (WFSF)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods.....	1
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
BIOL 2310 General Botany.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
CHEM 1010, 1020 or CHEM 1110, 1120.....	8
MATH ¹	<u>6</u>
Total	33

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
GEOL 1040 Physical Geology.....	4
GEOL 2000 Earth Evolution & Life History.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH ¹	3
Humanities/Fine Arts Electives.....	6
PC 2500 or COMM 2025.....	<u>3</u>
Total	28

Junior Year	sem. hrs.
BIOL 3810 General Genetics.....	4
BIOL 3920 Biological Communication Skills.....	3
WFS 3130 General Ecology.....	4
WFS 4500 National Wildlife Policy.....	3
WFS 4710 Fisheries Management.....	4
WFS 4810 Ichthyology.....	3
Science Directed Electives ²	<u>6-10</u>
Total	27-31

Senior Year	sem. hrs.
BIOL 3240 Field Botany.....	3
BIOL 4610 Invertebrate Zoology.....	3
BIOL 4780 Phycology.....	3
WFS 4760 Fish Culture.....	4
WFS 4840 Limnology.....	3
WFS 4740 Wildlife Principles.....	2
Social/Behavioral Sciences Electives.....	6
Electives.....	<u>4-8</u>
Total	28-32

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

² Choose two courses from AGRN 2300 plus AGRN 2310 (both must be taken concurrently and count as a single course for this requirement), BIOL 3530, BIOL 4330 (5330), WFS 4730 (5730) WFS 4770 (5770), and GEOG 4410 (5410) or GEOG 4510 (5510) or WFS 4870 (5870) (only one of these final three courses will count toward this requirement.)

WILDLIFE SCIENCE CONCENTRATION (WFSW)**(Leading to the Bachelor of Science Degree)**

Freshman Year	sem. hrs.
BIOL 1000 Introduction to Biological Methods.....	1
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
BIOL 2310 General Botany	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
CHEM 1010, 1020 or CHEM 1110, 1120	8
MATH ¹	6
Total	33

Sophomore Year	sem. hrs.
ENGL 2130, 2235, or 2330.....	3
GEOL 1040 Physical Geology.....	4
GEOL 2000 Earth Evolution & Life History.....	3
HIST 2010 Early United States History.....	3
HIST 2020 Modern United States History.....	3
MATH ¹	3
Humanities/Fine Arts Electives.....	6
PC 2500 or COMM 2025.....	3
Total	28

Junior Year	sem. hrs.
BIOL 3240 Field Botany	3
BIOL 3810 General Genetics	4
BIOL 3920 Biological Communication Skills.....	3
BIOL 4330 Plant Ecology	3
WFS 3130 General Ecology.....	4
WFS 3500 Wildlife Law Enforcement.....	3
WFS 4740 Wildlife Principles	2
Science Directed Electives ²	6-10
Total	25-27

Senior Year	sem. hrs.
WFS 4500 National Wildlife Policy	3
WFS 4660 Wild Bird Ecology	3
WFS 4670 Wild Mammal Ecology.....	3
WFS 4700 Habitat Management	3
WFS 4830 Herpetology	3
WFS 4790 Wildlife Techniques	6
AGHT 3450 Dendrology	3
Social/Behavioral Sciences Electives.....	6
Electives	2-4
Total	32-34

¹ Three math/statistics courses are required, one each from the following pairs of courses: either MATH 1130 or MATH 1710, either MATH 1530 or MATH 1830, and either MATH 3070 or BIOL/WFS 4220.

² Choose two courses from AGHT 3450, AGRN 2300 plus AGRN 2310 (both must be taken concurrently and count as a single course for this requirement), BIOL 3530, BIOL 4320 (5320), BIOL 4840 (5840), WFS 4770 (5770), WFS 4800 (5800), and GEOG 4410 (5410) or GEOG 4510 (5510) or WFS 4870 (5870) (only one of these final three courses will count toward this requirement.)

PRE-PROFESSIONAL PROGRAMS**FOR DEGREE PROGRAMS - SEE APPLIED CHEMISTRY**

In addition to the pre-professional curricula offered in medicine, dentistry, optometry and pharmacy, Tennessee Technological University also offers pre-professional programs in auxiliary or paramedical specialties of the health professions, including medical technology, dental hygiene, physical therapy, health information management, and others.

Students who wish to apply for admission to an allied health professional program without a degree from Tennessee Technological University should follow one of the programs listed under the pre-professional programs and consult with a pre-professional health science advisor. These programs closely fit requirements of most professional schools. Students desiring a Bachelor of Science degree from a professional school should plan to meet the requirements of that professional school.

Program Name

Pre-Dental Hygiene.....	2 years
Pre-Dentistry	3 years
Pre-Health Information Management	3 years
Pre-Medical Technology	2 years
Pre-Medicine	3 years
Pre-Occupational Therapy	2 years
Pre-Optometry.....	3 years
Pre-Pharmacy	2 or 3 years
Pre-Physical Therapy.....	3 years or B.S. degree
Pre-Physician Assistant	

PRE-DENTAL HYGIENE (PDHY)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
CHEM 1010 or CHEM 1110.....	4
CHEM 1020 or CHEM 1120.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1130 College Algebra	3
MATH 1530 Introductory Statistics.....	3
PSY 1030 Introduction to Psychology	3
SOC 1010 Introduction to Sociology	3
UNPP 1020 First-Year Interactions & Advisement.....	1
Total	31

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 2020 Human Anatomy & Physiology II.....	4
BIOL 3230 Health Science Microbiology.....	4
ENGL 2130, 2235, or 2330	3
HEC 2020 Nutrition for Health Sciences	3
HIT 1010 Medical Terminology	3
COMM 2025 Fundamentals of Communication	3
Electives ²	6
Total	30

- ¹ ETSU requires MATH 1530 - Introductory Statistics; UTHSC requires MATH 1130 – College Algebra.
- ² For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective courses be taken from core requirements or a selected degree program. HIST 2010 – Early United States History and HIST 2020 – Modern United States History are required pre-requisites at some dental hygiene programs.

PRE-DENTISTRY (PDEN)

Completion of this three-year program meets the requirements for admission to most dental schools but does not guarantee entrance. Admission into any professional school is competitive.

Freshman Year	sem. hrs.
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH ¹	6
Electives ²	3
UNPP 1020 First-Year Interactions & Advisement.....	1
Total	32

Sophomore Year	sem. hrs.
CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II.....	4
ENGL 2130, 2235, or 2330.....	3
PHYS 2010 Algebra-based Physics I.....	4
PHYS 2020 Algebra-based Physics II.....	4
Electives (Humanities-3 hours) ²	13
Total	32

Junior Year	sem. hrs.
CHEM 4610 General Biochemistry.....	3
CHEM 4620 General Biochemistry.....	3
BIOL Elective.....	4
BIOL 3230 Health Science Microbiology.....	4
Electives ²	14
Total	28

It is recommended that students have at least 120 semester hours credit or a B.A. or B.S. degree to be competitive for admission.

- ¹ A course in Calculus and a course in Statistics are recommended.
- For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program. Additional courses in Chemistry and Biology are suggested.

PRE-HEALTH INFORMATION MANAGEMENT* (PHIM)

Freshman Year	sem. hrs.
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH 1530 Introductory Statistics.....	3
Social/Behavioral Sciences Electives.....	6
Electives ¹	15
UNPP 1020 First-Year Interactions & Advisement.....	1
Total	31

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 2020 Human Anatomy & Physiology II.....	4
DS 2810 Computer Applications in Business.....	3
ENGL 2130, 2235 or 2330.....	3
COMM 2025 Introduction to Speech Communication.....	3
Electives ¹	14
Total	31

Junior Year	sem. hrs.
BMGT 3510 Management & Organization Behavior.....	3
BMGT 3630 Human Resource Management.....	3
DS 3860 Business Database Management.....	3
DS 4330 Management Information Systems Analysis and Design.....	3
HIT 1010 Medical Terminology.....	3
Electives ¹	15
Total	30

- ¹ The University of Tennessee Health Science Center's (UTHSC) entry-level Master of Health Informatics and Information Management (MHIM) program requires a baccalaureate degree and completion of prerequisite courses (above). It is recommended that elective hours be taken from general education core requirements, a selected degree program, and the following suggested electives: ACCT 2110, FIN 3210, LAW 2810 or LAW 4720.

PRE-MEDICAL TECHNOLOGY (PMT)

Freshman	sem. hrs.
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
Humanities/Fine Arts Elective.....	3
MATH 1130 College Algebra.....	3
PSY 1030 Introduction to Psychology.....	3
UNPP 1020 First-Year Interactions & Advisement.....	1
Total	32

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I.....	4
BIOL 3230 Health Science Microbiology.....	4
CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II.....	4
ENGL 2130, 2235, or 2330.....	3
COMM 2025 Fundamentals of Communication.....	3

Electives ¹	7
Total	29

Junior Year	sem.
	hrs.
BIOL 4040 Immunology	3
Electives ^{1,2}	27
Total	30

¹ For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective courses be taken from core requirements or a selected degree program, or the following recommended electives: HIST 2010, HIST 2020, BIOL 2020, BIOL 3810, CHEM 3410, CHEM 4610 (5610) or CHEM 4500, and CHEM 3420.

PRE-MEDICINE (PMED)

Completion of this three-year program meets the requirements for admission to most medical schools but does not guarantee entrance. Admission to any professional school is competitive.

Freshman Year	sem.
	hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
PSY 1030 Introduction to Psychology	3
SOC 1010 Introduction to Sociology	3
UNPP 1020 First-Year Interactions & Advisement	1
Elective	3
Total	32

Sophomore Year	sem.
	hrs.
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
ENGL 2130, 2235, or 2330	3
MATH 3070 Statistical Methods I	3
PHYS 2010 Algebra-based Physics I	4
PHYS 2020 Algebra-based Physics II	4
Electives (Humanities-3 hours) ¹	10
Total	32

Junior Year	sem.
	hrs.
CHEM 4610 General Biochemistry	3
CHEM 4620 General Biochemistry	3
BIOL Elective	4
Electives ¹	18
Total	28

It is recommended that students have at least 120 semester hours credit or a B.A. or B.S. degree to be competitive for admission.

¹ For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program. Additional courses in Chemistry and Biology are suggested.

PRE-OCCUPATIONAL THERAPY (POTH)

Freshman Year	sem.
	hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
CHEM 1110 General Chemistry I	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
Humanities/Fine Arts Electives	6
PSY 1030 Introduction to Psychology	3
SOC 1010 Introduction to Sociology	3
UNPP 1020 First-Year Interactions & Advisement	1
Total	31

Sophomore Year	sem.
	hrs.
BIOL 2010 Human Anatomy & Physiology I	4
BIOL 2020 Human Anatomy & Physiology II	4
ENGL 2130, 2235, or 2330	3
PHYS 2010 Algebra-based Physics I	4
PSY 2130 Life Span Developmental Psychology	3
PSY 4300 Adult Psychology	3
PSY 4160 Abnormal Psychology	3
COMM 2025 Fundamentals of Communication	3
Electives ¹	3
Total	30

Junior Year	sem.
	hrs.
EXPW 4420 Kinesiology	3
HEC 2220 or HIT 1010	1-3
MATH 1530 or PSY 3010	3
ANTH 1100 Introduction to Anthropology	3
Electives ¹	18-20
Total	30

- ¹ For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program.
- ² Occupational Therapy (OTD and MS) programs generally require a course in statistics. Courses from various departments may satisfy this requirement.

PRE-OPTOMETRY (POPT)

Completion of this three-year program meets the requirements for admission to most Optometry schools but does not guarantee entrance. Admission to any professional school is competitive.

Freshman Year	sem.
	hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1730 Pre-calculus Mathematics	5
MATH 1910 Calculus I	4
UNPP 1020 First-Year Interactions & Advisement	1
Total	32

Sophomore Year	sem. hrs.
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
ENGL 2130, 2235, or 2330	3
Humanities/Fine Arts	3
MATH 1530 Introductory Statistics	3
PHYS 2010 Algebra-based Physics I	4
PHYS 2020 Algebra-based Physics II	4
Electives	6
Total	31

Junior Year	sem. hrs.
BIOL 3230 Health Science Microbiology	4
Social Science	6
PSY 1030 Introduction to Psychology	3
CHEM 4610 General Biochemistry	3
General Education core or Major	12
Total	28

¹ For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program. BIOL 2010 - Human Anatomy and Physiology I, BIOL 2020 - Human Anatomy and Physiology II, and BIOL 3140 - Cellular Biology are highly recommended at some optometry schools.

PRE-PHARMACY (PPHA)

It is recommended that Pre-Pharmacy students research the requirements at the various Pharmacy schools and see a Pre-Professional advisor with specific questions regarding the different entrance pathways. The Pre-Pharmacy requirements at most Pharmacy schools may be completed in two to three years. Many students elect to apply to Pharmacy school after completing three years of prerequisite coursework in order to improve their science background, maturity and competitiveness. Others complete a Bachelor's degree before matriculating to Pharmacy school. Students with an interest in chemistry may elect to follow the first three years of coursework towards the Applied Chemistry major and earn a Bachelor of Science Degree with a major in Chemistry from TTU after completing their first year of Pharmacy school.

Entrance into a Doctor of Pharmacy program is competitive and is not guaranteed solely by completing the prerequisite coursework outlined below.

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1530 Introductory Statistics	3
MATH 1830 or 1910 ¹	3-4
UNPP 1020 First-Year Interactions & Advisement	1
Total	29-30

Sophomore Year	sem. hrs.
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Electives	6
BIOL 3230 Health Science Microbiology	4
CHEM 3010 Organic Chemistry I	4
CHEM 3020 Organic Chemistry II	4
ECON 2010 Principles of Microeconomics	3
ENGL 2130, 2235, or 2330	3
PHYS 2010 Algebra-based Physics I	4
Total	31

Junior Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I	4
BIOL 2020 Human Anatomy & Physiology II	4
Humanities/Fine Arts Elective	3
Social/Behavioral Sciences Elective	3
COMM 2025 Fundamentals of Communication	3
Electives	12
Total	29

For students intending to earn a Bachelor's degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program.

¹ Some B.S. majors including Chemistry, Physics, Math, and Engineering require MATH 1910 while others such as Biology may require MATH 1830.

² Beginning Fall 2018, Belmont University College of Pharmacy requires a second communication skills course for applicants without a Bachelor's Degree. This course should be designed to improve communication skills and may include a third writing course.

PRE-PHYSICAL THERAPY³ (PPTH)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I	4
BIOL 1123 General Biology II	4
CHEM 1110 General Chemistry I	4
CHEM 1120 General Chemistry II	4
ENGL 1010 English Composition I	3
ENGL 1020 English Composition II	3
MATH 1130 or 1710	3
Humanities/Fine Arts Elective	3
UNPP 1020 First-Year Interactions & Advisement	1
Total	29

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy & Physiology I	4
BIOL 2020 Human Anatomy & Physiology II	4
ENGL 2130, 2235, or 2330	3
PHYS 2010 Algebra-based Physics I	4
PHYS 2020 Algebra-based Physics II	4
PSY 1030 Introduction to Psychology	3
PSY 2130 Life Span Developmental Psychology	3
Electives	6
Total	31

Junior Year	sem. hrs.
EXPW 4440 Physiology of Exercise	3
MATH 1530 Introductory Statistics	3

Electives ¹	<u>25</u>
Total	31

¹ It is recommended that elective hours be taken from core requirements or a selected degree program.

PRE-PHYSICIAN ASSISTANT (PPA)

Freshman Year	sem. hrs.
BIOL 1113 General Biology I.....	4
BIOL 1123 General Biology II.....	4
CHEM 1110 General Chemistry I.....	4
CHEM 1120 General Chemistry II.....	4
ENGL 1010 English Composition I.....	3
ENGL 1020 English Composition II.....	3
MATH ¹	6
PSY 1030 Introduction to Psychology ²	3
UNPP 1020 First-Year Interactions & Advisement.....	<u>1</u>
Total	32

Sophomore Year	sem. hrs.
BIOL 2010 Human Anatomy and Physiology I.....	4
BIOL 2020 Human Anatomy and Physiology II.....	4
CHEM 3010 Organic Chemistry I.....	4
CHEM 3020 Organic Chemistry II.....	4
ENGL 2130, 2235, or 2330.....	3
PSY 2130 Life Span Developmental Psychology.....	3
Humanities/Fine Arts Elective.....	3
General Education Core or Major.....	<u>6</u>
Total	31

Junior Year	sem. hrs.
BIOL 3230 Health Science Microbiology.....	4
BIOL 3810 General Genetics.....	4
CHEM 4610 General Biochemistry.....	3
HEC 2220 or HIT 1010.....	1-3
COMM 2025 Fundamentals of Communication.....	3
PSY 4160 Abnormal Psychology.....	3
General Education Core or Major.....	<u>10-12</u>
Total	30

A course in College Algebra (MATH 1130) or higher and a course in Statistics fulfills the math requirements at most PA schools.

Physician Assistant Master's Degree Programs require a Bachelor's degree prior to admission.

The Graduate Record Exam (GRE) must be taken for most PA programs.

Health care experience hours, especially those that require direct patient interaction, are required by most PA programs. Job shadowing with a PA is also highly recommended.

Additional recommended courses for competitive entry into Physician Assistant Programs include: Biochemistry, Cell Biology, Immunology, Embryology, Parasitology, Psychology, and other advanced Biology and Chemistry courses.

Accounting (ACCT)

Enrollment in junior or senior level accounting courses requires junior standing. All business majors must have completed the Basic Business Program.

ACCT 1040. Personal Tax. Lec. 3. Credit 3.
Preparation of federal income tax returns for individuals, with some emphasis on tax planning. To receive credit for both ACCT 1040 and ACCT 3330, ACCT 1040 must be taken prior to enrolling in ACCT 3330 or its equivalent.

ACCT 2110. Principles of Accounting I. Lec. 3. Credit 3.
Prerequisite: Sophomore standing or consent of instructor. Fundamental principles and procedures of financial accounting.
(ACCT 1010, TTP Course)

ACCT 2120. Principles of Accounting II. Lec. 3. Credit 3.
Prerequisite: ACCT 2110. Fundamental principles and procedures of financial and managerial accounting.
(ACCT 1020, TTP Course)

ACCT 3170. Financial Accounting and Reporting I. Lec. 3. Credit 3.
Prerequisite: ACCT 2110 and ACCT 2120 with grades of C or better. Contemporary theory and procedures that provide information for reports of the financial positions, results of operations and cash flows of modern business corporations. Accounting majors must earn a grade of C or better to graduate.

ACCT 3180. Financial Accounting and Reporting II. Lec. 3. Credit 3.
Prerequisite: ACCT 3170 with grade of C or better. Continuation of ACCT 3170 with emphasis on specific problem areas. Accounting majors must earn a grade of C or better to graduate.

ACCT 3210. Cost Accounting. Lec. 3. Credit 3.
Prerequisite: ACCT 2120 with grade of C or better. Procedures for providing accounts and reports of cost information to management for planning, controlling, pricing and external reporting. Accounting majors must earn a grade of C or better to graduate.

ACCT 3330. Federal Taxation I. Lec. 3. Credit 3.
Prerequisite: ACCT 3170 with a grade of C. A survey of the basic concepts of taxation and the impact of federal taxation on individuals, business income and property transactions. Accounting majors must earn a grade of C or better to graduate.

ACCT 3620. Auditing I. Lec. 3. Credit 3.
Prerequisite: ACCT 3170 with a grade of C or better. Introduction to the theory and practice of financial statement audits. Accounting majors must earn a grade of C or better to graduate.

ACCT 3720. Survey of Accounting. Lec. 3. Credit 3.
Basic accounting principles, financial statements, cost behavior, cost accounting systems, and costing for management decisions. Open to non-business majors only. Credit will not be granted for both ACCT 2110 or ACCT 2120 and ACCT 3720.

ACCT 4230 (5230). Advanced Managerial Accounting. Lec. 3. Credit 3.
Prerequisite: ACCT 3210 with a grade of C or better. Selected problems in cost accounting with emphasis on managerial uses of cost information. Students may not receive credit for both the 4000-level and the 5000-level of the same class.

ACCT 4340. Tax Management for Entities. Lec. 3. Credit 3.
Prerequisite: ACCT 3330. Use of tax law and accounting data by management in planning, controlling, and decision making for business entities.

ACCT 4410. Financial Accounting and Reporting III. Lec. 3. Credit 3.
Prerequisite: ACCT 3180 with a grade of C or better. Theory and problems relating to consolidations and liquidations, international accounting, governmental accounting and partnerships.

ACCT 4530. Governmental and Not-For-Profit Accounting. Lec. 3. Credit 3.
Prerequisite: ACCT 2110 and ACCT 2120 with minimum grades of C. Accounting, reporting, and budgeting for governmental entities and other not-for-profit organizations, including coverage of healthcare and voluntary welfare organizations.

ACCT 4600 (500). Forensic Accounting and Fraud Auditing. Lec. 3. Credit 3.
Prerequisite: Junior standing in the accounting major. Exposure to applicable authoritative literature, as well as to tools and methods used by modern forensic accountants and auditors to identify accounting and financial statement frauds. Students may not receive credit for both the 4000-level and the 5000-level of the same class.

ACCT 4700 (5700). International Experiences in Accounting. Lec. 3. Credit 3.
Prerequisite: Consent of instructor and Department Chairperson. A short-term study abroad program

highlighting selected historical and modern contributions to accounting and business from another country and culture. Course will also meet weekly during the semester. Students may not receive credit for both the 4000-level and the 5000-level of the same class.

ACCT 4750. Auditing in an EDP Environment.

Lec. 3. Credit 3.

Prerequisite: ACCT 3620. Audit concepts and practices applied to accounting information systems in a microcomputer environment.

ACCT 4800. Internship in Accounting.

Lec. 3. Credit 3.

Prerequisite: Consent of Department Internship Coordinator or Department Chairperson and, if for graduate credit, consent of MBA Director. A directed current professional experience in accounting. Graduate credit requires a field research project.

ACCT 4900. Special Topics.

Credit 3.

Prerequisite: Consent of Instructor and Department Chairperson. An advanced course concerning current topics in Accounting, Auditing, Taxation, and Business Law. Course may be taken more than once as topics change.

ACCT 4901. Special Topics.

Credit 1.

Prerequisite: Consent of instructor and Department chairperson. An advanced course concerning current topics in Accounting, Auditing, Taxation, and Business Law. Course may be taken more than once as topics change.

ACCT 4902. Special Topics.

Credit 2.

Prerequisite: Consent of instructor and Department chairperson. An advanced course concerning current topics in Accounting, Auditing, Taxation, and Business Law. Course may be taken more than once as topics change.

College of Agriculture and Human Ecology (AGHE)

AGHE 1020. Connections to Agriculture and Human Ecology.

Lec. 2. Credit 1.

Connects students to the university and College of Agriculture & Human Ecology through meaningful academic and non-academic, out-of-classroom activities. Emphasizes critical thinking in the formation of academic and social groups, group participation, and in self-management and study skills.

AGHE 2022. Professionalism in Agriculture and Human Ecology.

Lec. 1. Credit 1.

Appropriate social and professional standards of

behavior as applied to the community and workplace environments.

AGHE 3000 (WSL2) Leadership and Service.

Lec. 3 Credit 3.

This course will identify students' leadership and communication capacities (soft skills) and demonstrate how they can be more effective and impactful in the workplace. Pedagogical tools include TED Talks, guest speakers, up-to-date curriculum, personality assessments (Jung Typology, Strengths Finder 2.0, and True Colors) and service learning activities that enable students to share their gifts and talents with the TTU and Putnam County communities.

AGHE 3275. Research in Agriculture and Human Ecology.

Lec. 3. Credit 3.

Prerequisite: Sophomore standing, AGHE 2022. Comprehensive introduction to research methodologies, proposal and grant writing, and applications of research to practice. Research presentation techniques.

AGHE 3900-3903. Leadership for Ambassadors.

Lec. 1. Credit 1.

Prerequisite: Consent of instructor. Application of leadership skills while serving as Ambassador for the College of Agriculture and Human Ecology.

AGHE 4500. Senior Seminar.

Lec. 1. Credit 1.

Prerequisite: Senior standing. Application of leadership and professional skills in Agriculture and Human Ecology. Public policy and advocacy guidelines for the professions of Agriculture and Human Ecology.

AGHE 4600 (5600). Global Food Systems: Sustainability and Insecurity.

Lec. 3. Credit 3.

Relationships of global food systems to environmental and human health. Dynamics of societal issues, population, food production, biodiversity, biotechnology and economics on food insecurity.

Agribusiness Economics (AGBE)

(O) and (E) Denote Odd and Even Years Respectively

◆ **AGBE 2010. World Food and Society.**

Lec. 3. Credit 3.

Food production and distribution for the advancement of societies in developed and developing countries.

AGBE 2100. Economics of Agriculture.

Lec. 3. Credit 3.

Economic principles as they relate to agriculture, and the place of agriculture and agribusiness in the national economy.

AGBE 3110. Agricultural Marketing and Futures.

Lec. 3. Credit 3.

Prerequisite: AGBE 2100. Institutions involved in marketing agricultural products and the use of futures and hedging.

AGBE 3120. Agricultural Price Analysis.-Spring. (O)

Lec. 3. Credit 3.

Prerequisite: AGBE 2100. Principles of price determination, price indexes and their use, parity price, and tools of price analysis.

AGBE 3400. Agricultural Finance.-Spring.

Lec. 3. Credit 3.

Prerequisite: ACCT 2110. Financial statements and analyses for farms and agribusiness firms, time value of money, capital and credit requirements and sources.

AGBE 3950. Agribusiness Internship. Credit 3.

Prerequisite: AGBE 2100 and junior standing. Supervised off-campus internship in production agriculture, or the agricultural service industry, or an agricultural agency of the government. A minimum of eight weeks of full-time work is required to fulfill three credit hours.

AGBE 4030. Agribusiness Management.

Lec. 3. Credit 3.

Prerequisites: AGBE 2100 and AGBE 3400. Economics and business principles applied to farm management, resources allocation, budgeting, and records. Students who have not had prerequisites can request permission from the instructor.

AGBE 4120 (5120). Natural Resource Economics.-Fall.

Lec. 3. Credit 3.

Prerequisite: AGBE 2100 or ECON 2010. Static and dynamic models of renewable and non-renewable resource allocation. Application of principles of economics will identify the causes, consequences, and ways of dealing with natural resource problems, including problems associated with fisheries, forests, water problems, and land.

AGBE 4130. Agricultural Policy. Lec. 3. Credit 3.

Prerequisite: AGBE 2100. Rural and urban values, farm problems, relationship of agriculture to public policy, policy vs. programs, and appraisal of program results.

AGBE 4210 (5210). Agricultural and Biological Statistics.-Fall.

Lec. 3. Credit 3.

Sampling, probability, distributions, statistical tests, analysis of variance, regression, and interpretation of data.

AGBE 4940, 4950 (5940, 5950). Agribusiness Economics Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agribusiness economics under the supervision of a member of the School of Agriculture faculty.

AGBE 4960, 4970, 4980. Agribusiness Economics Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agribusiness economics under the supervision of a member of the School of Agriculture faculty.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Agricultural Communications (AGCM)

AGCM 2010. Introduction to Agricultural Communications.

Lec. 2. Lab. 2. Credit 3.

An introduction to agricultural communications emphasizing agricultural media production in print and digital forms.

AGCM 3010. Theory and Practice of Agricultural Publishing.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGCM 2010. An introduction to the agricultural publishing industry, including the role magazines play in agricultural communications.

AGCM 4850. Internship in Agricultural Communications.

Credit 4.

Prerequisite: Senior standing in Agricultural Communications. Supervised internship in an educational, Extension, or agricultural business/agency involving agricultural communications and related fields.

AGCM 4860. Internship in Agricultural Communications.

Credit 4.

Prerequisite: Senior standing in Agricultural Communications. Supervised internship in an educational, Extension, or agricultural business/agency involving agricultural communications and related fields.

AGCM 4890. Agricultural Publication Production.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGCM 3010. An authentic immersion into organizing, funding, and managing a professional, agricultural publication business.

Agricultural Education (AGED)

AGED 2120. Introduction to Agricultural and Extension Education. Lec. 2. Lab. 2. Credit 3.
History, philosophy, goals, objectives and current issues in agricultural and extension programs. Early field experience in a high school Agricultural Education program or a County Agricultural Extension Service program.

AGED 3010. Professional Leadership Development. Lec. 2. Lab. 2. Credit 3.
Leadership styles and roles and their implications for agricultural professionals; developing leadership, communication and interpersonal skills; planning and conducting effective meetings.

AGED 4110. Methods of Teaching Agriscience. Lec. 2. Lab. 2. Credit 3.
Planning, implementing and evaluating the high school Agriscience course offered for science credit; course and lesson planning; laboratory facilities and equipment; and instructional methods and techniques for agriscience.

AGED 4150 (5150). Communications and Public Relations in Agricultural and Extension Education. Lec. 3. Credit 3.
Publics to be dealt with, public relations media, techniques of establishing and maintaining desirable communications, and public relations in agriculture.

AGED 4200 (5200). Methods and Techniques of Teaching in Agricultural and Extension Education. Lec. 2. Lab. 2. Credit 3.
Theory and practice in directing learning activities; planning and delivering instruction to formal and informal groups in Agricultural and Extension Education; preparing instructional materials; and using instructional technology.

AGED 4250 (5250). Use of Volunteers in Agricultural and Extension Education. Lec. 3. Credit 3.
Developing skills in selecting, recruiting, training, coordinating, supervising, and evaluating volunteers in Agricultural and Extension Education.

AGED 4300 (5300). Development of Youth Programs in Agricultural and Extension Education. Lec. 3. Credit 3.
Developing, implementing and evaluating the 4-H and FFA youth programs in Agricultural and Extension Education; identifying needs and interests of youth; and identifying, securing, and developing supportive resources.

AGED 4350 (5350). Program Planning and Evaluation in Agricultural and Extension Education.

Lec. 3. Credit 3.

Advanced principles and procedures used in planning and evaluating Agricultural and Extension Education programs.

AGED 4850. Internship. Credit 4.
Prerequisite: * Senior standing. Supervised internship in an educational, extension, or agricultural business/agency involving agricultural communications and related fields.

AGED 4860. Internship. Credit 4.
Prerequisite: * Senior standing. Supervised internship in an educational, extension, or agricultural business/agency involving agricultural communications and related fields.

AGED 4870. Student Teaching in Agricultural Education I. Credit 5.
Prerequisite: full admission to Teacher Education Program; senior classification. Corequisite: AGED 4880, AGED 4890. Application for student teaching should be made at least two semesters in advance, excluding the summer term. All activities directly related to teaching performance, such as planning and presenting lessons, directing study, and managing the classroom. A grade of B is required to meet degree requirements.

AGED 4871. Residency I. Credit 5.
Corequisite: AGED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

AGED 4872. Professional Seminar I. Credit 5.
Corequisite: AGED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

AGED 4880. Student Teaching in Agricultural Education II. Credit 5.
Corequisite: AGED 4870, AGED 4890. Non-instructional aspects of teaching, such as personal-professional characteristics, human relations skills, and educational philosophy. A grade of B is required to meet degree requirements.

AGED 4881. Residency II. Credit 10.
Prerequisite: AGED 4871 with a grade of B. Corequisite: AGED 4882. Performance based full time clinical

experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

AGED 4882. Professional Seminar II. Credit 2.
Corequisite: AGED 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

AGED 4890. Seminar: Education and Society. Credit 2.
Corequisite: AGED 4870, AGED 4880. Seminar on issues related to the interrelationships among school, culture and society; a historical, philosophical, and sociological analysis.

AGED 4940, 4950 (5940, 5950). Agricultural Education Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of agricultural education under the supervision of a member of the School of Agriculture faculty.

AGED 4960, 4970, 4980. Agricultural Education Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of agricultural education under the supervision of a member of the School of Agriculture faculty.

*** No more than a total of 12 credits of Work Experience, Internship, and/or Co-op or any combination of these may apply toward the Bachelor of Science degree in Agriculture.**

Agricultural Engineering Technology (AGET)

(O) and (E) Denote Odd and Even Years Respectively

AGET 2110. Agricultural Engineering Technology-Fall. (E). Lec. 2. Credit 2.
Corequisite: AGET 2115. Application of engineering principles to agriculture through a selection of independent but related topics while also advancing the students problem solving skills.

AGET 2115. Agricultural Engineering Technology Laboratory.-Fall. Lab. 2. Credit 1.
Corequisite: AGET 2110. Application of engineering principles to agriculture through a selection of independent but related topics.

AGET 3110. Natural Resource Systems.-Spring. Lec. 2. Credit 2.

Corequisite: AGET 3115. Application of engineering principles to surveying, soil and water conservation and animal waste management.

AGET 3115. Natural Resource Systems Laboratory.-Spring. Lab. 2. Credit 1.
Corequisite: AGET 3110. Application of engineering principles to surveying, soil and water conservation and animal waste management.

AGET 3320. Small Power Equipment.-Spring. (O). Lec. 2. Credit 2.

Corequisite: AGET 3325. Principles of operation, adjustment and maintenance of small internal combustion engines and associated equipment.

AGET 3325. Small Power Equipment Laboratory.-Spring (O). Lab. 2. Credit 1.

Corequisite: AGET 3320. Maintenance, service and overhaul of small internal combustion engines and associated equipment.

AGET 3510. Agricultural Surveying. Lec. 2. Lab. 3. Credit 3.

Elementary surveying including use of the steel tape, level and transit with practice in traversing, and leveling and area computations.

AGET 3520. Agricultural Spatial Technologies I. Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 2300. Principles and applications of geospatial technologies supporting precision agriculture/farming and planning for natural resource data management. Global positioning system (GPS), geographic information system (GIS), remote sensing (RS), yield monitoring and mapping, Internet information access, and computer software for management decisions.

AGET 3540. Fundamentals of GIS and GPS in Agriculture and Natural Resources. Lec. 2. Lab. 2. Credit 3.

This introductory course will teach fundamentals of the Global Positioning System (GPS) and Geographic Information System (GIS) concepts, equipment, and software used in agricultural, environmental, and natural resource applications.

AGET 3560. Turf Systems Irrigation Design.-Summer and Fall (E). Lec. 2. Credit 2.

Corequisite: AGET 3565. Irrigation system design for turf-based systems including residential lawns, commercial properties, athletic fields, and golf courses. Irrigation scheduling and water demand are presented to

provide management capabilities.

AGET 3565. Turf Systems Irrigation Design Laboratory.-Summer and Fall (E).

Lab. 2. Credit 1.

Corequisite: AGET 3560. Residential, commercial, and athletic irrigation system assembly, installation, maintenance, and troubleshooting.

AGET 3620. Computer-Aided Design in Agriculture.-Summer and Fall (O).

Lec. 1. Lab. 4. Credit 3.

Prerequisite: AGET 2110 or consent of instructor. The principles of computer aided drafting and design with emphasis on agricultural operations.

AGET 4220 (5220). Agricultural Machinery and Tractors.-Spring. (E).

Lec. 2. Credit 2.

Corequisite: AGET 4225. Principles of operation, selection, and economic utilization of agricultural power units and equipment.

AGET 4225. Agricultural Machinery and Tractors Laboratory.-Spring (E).

Lab. 2. Credit 1.

Corequisite: AGET 4220 (5220). Application of agricultural power units and equipment operation principles.

AGET 4510 (5510). Agricultural Remote Sensing.

Lec. 2. Lab. 2. Credit 3.

This course will teach the fundamentals of remote sensing concepts and software used in agricultural, environmental, and natural resource applications.

AGET 4520 (5520). Agricultural Spatial Technologies II.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGET 3520. Principles and applications of geospatial technologies supporting precision agriculture/farming and planning for natural resource data management. Global positioning system (GPS), geographic information system (GIS), remote sensing (RS), yield monitoring and mapping, Internet information access, and computer software for management decisions.

AGET 4610 (5610). Greenhouse Structures and Landscaping Equipment.-Fall.

Lec. 3. Credit 3.

Selection, design, construction, and operation of greenhouse structures and related nursery and landscaping equipment.

AGET 4620 (5620). Agricultural Structures.-Spring. (E).

Lec. 3. Credit 3.

Planning; drawing; materials; principles of construction with respect to arrangement, location, and environmental control; plan reading.

AGET 4720 (5720). Agricultural Processing.-Spring (O).

Lec. 3. Credit 3.

Managing value-added agricultural products through the application of engineering principles to fluid flow, electrical controls, refrigeration, heat transfer, drying, and hydraulic systems.

AGET 4940, 4950 (5940, 5950). Agricultural Engineering Technology Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agricultural engineering technology under the supervision of a member of the School of Agriculture faculty.

AGET 4960, 4970, 4980. Agricultural Engineering Technology Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agricultural engineering technology under the supervision of a member of the School of Agriculture faculty.

Horticulture (AGHT)

(O) and (E) Denote Odd and Even Years Respectively

AGHT 3030. Integrated Pest Management.-Spring. (O).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: BIOL 1114. Introduction to the aspects of integrated pest management. Identification of plant disease and insect pest problems. Fundamentals of control: biological, cultural, and chemical. Plant disease concepts including etiology, ecology, and physiology.

AGHT 3250. Arborist Services.

Lec. 1. Lab. 4. Credit 3.

Basic training and experience in professional tree care and aerial tree work. Climbing equipment provided, students provide personal protective equipment after instruction.

AGHT 3400. Landscape Horticulture.-Fall.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100, AGRN 1110 or consent of instructor. Basic theory and principles of design for landscaping modern homes and businesses. Use of ornamental plants and special features. Installation, maintenance, and discussion of the effect of management on plant growth and health. Topics include pruning, fertilizer application, pest control, etc.

AGHT 3410. Plant Propagation.-Fall.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100, AGRN 1110, BIOL 1114, or consent of instructor. Asexual and sexual propagation of plants by cuttings, layers, division, special structures, grafting, budding, seeds, and tissue culture.

AGHT 3440. Floral Arrangement.-Fall.

Lec. 1. Lab. 4. Credit 3.

Fundamentals and theory of floral design with emphasis on arrangements for the home and special occasions.

AGHT 3450. Dendrology.-Fall.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 2110 or consent of instructor. The study of trees and the identification of native and urban species commonly found in the mid-South. Adaptability of the species to various ecological conditions of forest ecosystems and landscape environments will be discussed.

AGHT 3460. Interior Plantscaping.-Spring. (E).

Lec. 2. Lab. 2. Credit 3.

Identification, culture, production, and use of foliage plants in interior design; principles of design; and practices of maintenance.

AGHT 3470. Landscape Plant Materials.-Spring. (E).

Lec. 2. Lab. 3. Credit 3.

Uses and the identification of tree, shrub, and herbaceous plant species for landscapes. Ornamental characteristics and the adaptability of the species to various landscape conditions will be discussed.

AGHT (SPED) 3480. Horticultural Therapy.-Spring. (O).

Lec. 2. Lab. 2. Credit 3.

Introduction to the application of horticulture for special education and as therapy for treatment, rehabilitation, and/or training of individuals with disabilities.

AGHT 4410. Nursery Management.-Spring. (O).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGHT 3410. Principles of retail and wholesale nursery site selection, field and container production, and resource management. Students who have not had prerequisite can request permission from the instructor.

AGHT 4420. Greenhouse Management and Crop Production.-Spring (E).

Lec. 2. Lab. 3. Credit 3.

Prerequisite: AGHT 3410, AGET 4610 (5610), or request by advisor. Principles of greenhouse management and environmental controls; production, timing, harvesting, and marketing of commercial floricultural crops; pest control strategies; and nutrient film technique. Development of commercial production schedule required.

AGHT 4940, 4950 (5940, 5950). Horticulture Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of horticulture under the supervision of a member of the School of Agriculture faculty.

AGHT 4960, 4970, 4980. Horticulture Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of horticulture under the supervision of a member of the School of Agriculture faculty.

Agriculture (AGR)

AGR 1020. Connections to Agriculture.

Rec. 2. Credit 1.

An introduction for agricultural students to the social, educational, economic, and career opportunities, which are available on campus, in the local community, and the broader agricultural industry.

AGR 2890. Meeting the Challenges of a Diverse Workplace.

Lec. 3. Credit 3.

This course is designed as an upper division, work-world preparation course. As students ready to leave the relative safety of the cocooned worlds of their chosen disciplines, this course provides practical tools and information necessary to succeed in a diverse and changing world of work. By combining interactive learning, current and relevant readings, and key presenters the course will help completers integrate more smoothly into the next phase of their lives.

AGR 2910, 2920. Work Experience.

Credit Variable 1, 2, 3 per sem., Max. 9.*

Supervised on-campus work experience in agriculture. Credit awarded based on 3 hours of work per week during the semester for each hour of credit. Graded S/U only.

AGR 2940, 2950. Internship.

Credit Variable 1, 2, 3 per sem., Max. 9.*

Supervised off-campus work experience program in production agriculture, an agricultural agency of the government or an agribusiness. Credit awarded based on one month full-time employment for each hour of credit or equivalent. Graded S/U only.

AGR 2990. Experiential Agriculture.

Lab. 6. Credit 3.

Hands-on learning experience in a variety of agricultural production activities. Experiences may include but are not limited to livestock handling, crop production, landscaping, construction of agricultural structures and data collection and analysis.

AGR (HEC) 3900, 3901, 3902, 3903. Leadership Development for AG/HEC Ambassadors.

Lec. 1. Credit 1.

Prerequisite: Consent of instructor. Courses designed to improve leadership skills of AG/HEC Ambassadors.

AGR 3940, 3950, 3960. Advanced Internship.-(Fall, Spring, Summer). Credit 3.*

Prerequisite: Junior or Senior standing and recommendation of advisor; must conform to departmental guidelines. Supervised off-campus advanced placement program in production agriculture, an agricultural agency of the government or an agribusiness. A minimum of six weeks of full-time work is required to fulfill three credit hours.

AGR 4920. Senior Problem. Credit 3.

Prerequisite: Senior standing. Supervised research in area of interest to the student including data collection, analysis, interpretation of results and preparation of written report.

*** No more than a total of 12 credits of Work Experience, Internship, and/or Co-op or any combination of these may apply toward the Bachelor of Science degree in Agriculture.**

Agritourism (ATOU)**ATOU 2100. Agritourism Development and Promotion.** Lec. 3. Credit 3.

Agritourism has a direct economic impact on farms and surrounding communities. This course will delve into the tourism industry, strategies to develop and maintain farms and their heritage as tourism products, as well as explore strategies to document and promote the economics and cultural significance of agritourism. Open to both majors and non-majors.

ATOU 3020. Agriculture and Heritage Based Tourism. Lec. 3. Credit 3.

In order to understand the connection between agricultural traditions and heritage based tourism, one must understand the importance of resource strategies critical to the preservation and conservation of unique environmental and historical settings. This course will review the historical image of agriculturists and their connection to the land and how this connection ties to heritage based tourism. The course will delve into a variety of topics and methods to increase the importance of this new role awareness.

ATOU 4100. Direct Marketing for Agriculture and Human Ecology. Lec. 3. Credit 3.

Direct marketing shortens the marketing route and allows businesses to communicate with and deliver products directly to the consumer. This course will cover key elements of direct marketing in an agriculture and human ecology context, including retailing, merchandizing, social media marketing and services marketing. Open to both majors and non-majors.

ATOU 4200. Sustainable Tourism as Economic and Community Development. Lec. 3. Credit 3.

Prerequisite: ATOU 2100 or consent of instructor. Sustainable tourism is a strategy for economic and community development in rural areas around the world. This course will trace the inception of these concepts from the United Nations World Tourism Organization and follow their application in various locations, both internationally and within the US. Focus will be given to various types of niche tourism to achieve economic and community development goals.

Agronomy (AGRN)

(O) and (E) Denote Odd and Even Years Respectively

AGRN 1100. Plant Science.-Fall, Spring.

Lec. 3. Credit 3.

Introduction to the fundamentals of plant science as related to the ecological principles of agronomic and horticultural crops.

AGRN 1110. Plant Science Laboratory.

Lab. 2. Credit 1.

Corequisite: AGRN 1100 unless credit for AGRN 1100 has previously been earned.

AGRN 2240. Introduction to Soil Evaluation.-Fall.

Lab. 2. Credit 1.

For students interested in becoming members of the intercollegiate soil judging team.

AGRN 2240 Introduction to Soil Evaluation.-Fall.

Lab. 2. Credit 1.

For students interested in becoming members of the intercollegiate soil judging team.

AGRN 2300. Soils. Lec. 2. Lab. 2. Credit 3.

An introduction to soil physical and biological properties and their relationship to plant growth, land use and environmental quality.

AGRN 2310. Soil Chemical Properties.

Lec. 1. Credit 1.

Prerequisite: CHEM 1020, CHEM 1120, or consent of instructor. Corequisite: AGRN 2300. An introduction to soil chemical properties and their relationship to plant growth, land use and environmental quality.

AGRN 3010. Pesticide Safety/Certification.

Lec. 2 Credit 1.

Students receive training in the proper use of pesticides to protect public health and the environment. Students have the opportunity to be tested for the TN Private Pesticide Applicator Certification will be administered for an additional fee. 8 week course.

AGRN 3020. Crops in Sustainable Systems.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110. Botany and classification, importance, cultural practices (including tillage systems), pest control, crop improvement, harvesting, and uses of the principal crops of Tennessee and the United States. Agroecosystem concepts will be emphasized.

AGRN 3100. Turfgrass Management.-Fall. (E).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110 or consent of instructor. Establishment and management of special purpose grasses for lawns, golf courses, parks, playgrounds, athletic fields, and roadsides.

AGRN 3230. Environmental Soil Science.-Spring.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: AGRN 2300, AGRN 2310. Soil and water conservation as related to land use, land use planning, and impact of agriculture on the environment.

AGRN 3300. Organic Farming.

Lec. 2. Lab. 2. Credit 3.

An examination of organic crop production methods including improving the structure of soil and fertility, pest management, irrigation, season extension, vegetable and fruit crop production, harvesting, postharvest handling and marketing techniques.

AGRN 3350. Soil and Water Conservation.

Lec. 3. Credit 3.

Prerequisites: AGRN 2300 and AGRN 2310 or consent of instructor. Examination of soil health and water quality as impacted by natural and human influences. Emphasis on soil productivity conservation.

AGRN (HEC) 3610. Food Safety in Agritourism – Planning.

Lec. 2. Lab. 1. Credit 3.

Introductory course in food safety as applied to the planning, production, and processing of cool season crops using experiential learning techniques. Food and farm safety regulations as related to the Agritourism industry. Students earn pesticide handler certification.

AGRN (HEC) 3620. Food Safety in Agritourism - Growing and Harvesting.

Lec. 2. Lab. 1. Credit 3.

Prerequisite: AGRN 3610. Further application of food and farm principles and regulations with emphasis on planning, production, and processing of warm season crops. Students participate in dissemination of raw and processed products in various Agritourism settings.

AGRN (HEC) 3630. Food Safety in Agritourism - Postharvest.

Lec. 2. Lab. 1. Credit 3.

Prerequisite: AGRN 3620. Emphasis on postharvest

handling and storage of crops. Safe processing of agricultural products using traditional techniques. Students will demonstrate processing techniques in a variety of Agritourism settings.

AGRN 4100 (5100). Weed Science.-Fall. (O).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110 or consent of instructor. Plant and seed identification, and growth habits and dissemination of weeds. Biological, cultural, and chemical methods of control in the integrated pest management (IPM) concept.

AGRN 4120 (5120). Crop Improvement.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110 or consent of instructor. Objectives, genetic principles, and methods of crop improvement by conventional and genetic engineering methods.

AGRN 4110 (5110). Forage Crops Production and Management.-Spring.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100, AGRN 1110 and AGRN 2300, AGRN 2310. Botany and classification, soil and climatic requirements, species adaptation, establishment and management of grasses and legumes for silage, hay, and temporary, permanent, and rotational pastures for ruminants, swine, and horses.

AGRN 4210 (5210). Soil Fertility and Fertilizers.-Spring. (E).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 2300, AGRN 2310 or consent of instructor. Properties of soils in relation to plant nutrition, and fertilizer materials and their relationship to soil fertility.

AGRN 4220 (5220). Environmental Soil Chemistry.

Lec. 3. Credit 3.

Prerequisite: AGRN 2300, AGRN 2310 or consent of instructor. Study of chemical composition of natural and anthropogenic material in soil and their reactions and movement in the soil environment.

AGRN 4230 (5230). Soil Classification.-Fall.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 2300, AGRN 2310 or consent of instructor. Soil formation, morphology, and classification, and methods of soil survey and detailed mapping of an assigned area.

AGRN 4240. Advanced Soil Evaluation.-Spring.

Lab. 2. Credit 1.

Prerequisite: AGRN 2240. For members of the intercollegiate soil judging team.

AGRN 4940 (5940). Agronomy Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an

approved area of agronomy under the supervision of a member of the School of Agriculture faculty.

AGRN 4945. Soil Science Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty.

AGRN 4950 (5950). Agronomy Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty.

AGRN 4955. Soil Science Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty.

AGRN 4960. Agronomy Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty.

AGRN 4965 (5960). Soil Science Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty.

AGRN 4970. Agronomy Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty.

AGRN 4975. Soil Science Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty.

AGRN 4980. Agronomy Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty.

AGRN 4985. Soil Science Topics. Credit 1-4.
Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty.

Animal Science (ANS)

(O) and (E) Denote Odd and Even Years Respectively

ANS 1200. Introductory Animal Science.-Fall, Spring. Lec. 3. Credit 3.
Introduction to market classes, types, grades, and breeds of livestock and poultry; animal agricultural

products; basic animal biological processes as related to livestock production and management; and overview of careers related to animal agriculture.

ANS 1210. Introductory Animal Science Laboratory. Lab. 3. Credit 1.

Corequisite: ANS 1200 unless credit for ANS 1200 has previously been earned. Provides the opportunity for application of the basic principles of animal science with an emphasis on different types of livestock enterprises; animal types, breeds, form, and function; and common practices employed in management of major livestock enterprises.

ANS 2020. Livestock Management.-Spring. Lec. 1. Lab. 4. Credit 3.

Prerequisite: ANS 1200 and ANS 1210. Management techniques, practices and principles involved in meat animal production.

ANS 2110. Livestock Evaluation.-Fall. Lec. 1. Lab. 4. Credit 3.

Prerequisite: ANS 1200 and ANS 1210. Techniques for determining live animal composition. Effects of weight, muscling, and condition on carcass-based live animal value. Carcass quality and yield evaluation methods. Determining merit in breeding stock and introductory livestock judging.

ANS 2250. Animals and Society. Lec. 3. Credit 3.
Impacts of animals, and particularly companion animals, on human society, development, health and behavior.

ANS 3010. Animal Nutrition.-Fall. Lec. 2. Lab. 2. Credit 3.

Prerequisite: ANS 1200, ANS 1210, CHEM 1020 or CHEM 1120. Classes of nutrients, digestibility, metabolism, nutrient requirements of livestock, and feed analysis.

ANS 3020. Feeds and Feeding.-Spring. Lec. 2. Lab. 2. Credit 3.

Feed classification, nutrient requirements, ration formulation for various classes of livestock and dairy and conducting feeding trials.

ANS 3110. Livestock Judging.-Spring. (O). Lec. 1. Lab. 4. Credit 3.

Prerequisite: ANS 2110. Designed to train the student to become a competent judge of market and breeding classes of beef cattle, sheep, and swine.

ANS 3130. Animal Breeding.-Fall. Lec. 2. Lab. 2. Credit 3.

Genetics applied to the selection and improvement of livestock, heritability estimates, and selection indexes as applied to animal breeding.

ANS 3140. Reproduction in Farm Animals.-Spring.

Lec. 2. Lab. 2. Credit 3.

Reproduction in farm animals; anatomy, physiology, and endocrine control on reproduction; and applied reproduction methods in livestock and dairy animals.

ANS 3150. Common Diseases and Parasites of Domestic Animals.-Spring.

Lec. 3. Credit 3.

Prevention, diagnosis, and treatment of common diseases and parasites affecting farm animals.

ANS 3310. Meat, Dairy and Poultry Products.

Lec. 2. Lab. 2. Credit 3.

Food science applied principles regarding meat, dairy, and poultry products. Emphasis on food safety, quality and marketing issues.

ANS 3330. Anatomy and Physiology of Livestock Animals.

Lec. 3. Credit 3.

Overview of anatomical structures and physiological processes in biological systems. Specific emphasis will be given to livestock species including bovine, porcine, ovine and caprine species. Introductory cellular biology, tissue types, and specific organ systems stressing cases where livestock species may differ from other species.

ANS 4110. Beef Production and Management.-Fall. (O).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ANS 3010 or ANS 3020 or consent of instructor. Application of modern technology in breeding, feeding, financing, management and marketing of beef cattle.

ANS 4120. Swine Production and Management.-Fall. (E).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ANS 3010 or ANS 3020 or consent of instructor. Application of modern technology in breeding, feeding, financing, management and marketing of swine.

ANS 4130. Sheep Production and Management.-Spring. (O).

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ANS 3010 or ANS 3020 or consent of instructor. Breeds, feeding, management, marketing of sheep for lamb and wool production, and parasite and disease control.

ANS 4140. Commercial Poultry Production and Management.

Lec. 3. Credit 3.

Nutrition, reproduction and management of poultry.

ANS 4150. Equine Management.-Fall. (O).

Lec. 2. Lab. 2. Credit 3.

Overview of the equine industry, breeds, selection, handling and grooming, foot care, diseases, nutrition, reproduction, facilities, and management techniques.

ANS 4250. Companion Animal Management.

Lec. 2. Lab. 1. Credit 3.

Prerequisite: Junior standing. Care, management and uses of companion animals, particularly involving human health and well-being, and behavior modification in elementary school students.

ANS 4310. Dairy Herd Management and Supervision.-Spring. (E).

Lec. 2. Lab. 2. Credit 3.

Selection, feeding, management, supervision methods, DHIA record keeping, disease control, equipment selection and quality control methods in dairy production.

ANS 4940, 4950 (5940, 5950). Animal Science Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of animal science under the supervision of a member of the School of Agriculture faculty.

ANS 4960, 4970, 4980. Animal Science Topics.

Credit 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of animal science under the supervision of a member of the School of Agriculture faculty.

Anthropology (ANTH)

◆ANTH (SOC) 1100. Introduction to Anthropology.

Lec. 3. Credit 3.

Overview of the physical and cultural development of human beings from prehistoric times to the present.

ANTH 2002. Non-Western Cultures.

Lec. 3. Credit 3.

An introduction to the study of non-Western cultures and societies through their ideologies, language systems, ecologies, family structures, social stratification, religions and economic structures. A comparative approach will be emphasized.

ANTH (SOC) 2100. Cultural Ecology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Interaction between human cultural systems and the physical environment in prehistoric through modern times.

ANTH (CJ, SOC) 4040 (5040). Law and Culture.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A comparative cross-cultural analysis of primitive, traditional and modern attitudes toward law, social control, punishment and individual responsibility.

ANTH 4910 (5910). Independent Study.

Credit 1-3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of anthropology where there is no appropriate course. May be taken twice, provided that the topic is different.

ANTH 4960 (5960). Special Topics.

Credit 3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue or interest area in anthropology.

◆ **Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.**

Art Education (ARED)**ARED 1250. Digital Technologies in Art Education**

Studio 6. Credit 3.

Introduction to photographic techniques, image capture, formatting and manipulating still imagery in digital media for art and design work.

ARED 2020. Art Education Theory.

Lec. 1. Lab. 1. Credit 2.

Includes the theoretical, historical, philosophical, and sociological underpinnings of the field of Art Education. Intensive study of the historical and chronological development of Art Education will be featured.

Significant trends and movements which have defined Art Education over the last century will be presented. ARED 2020 is also designed to apply the theories learned through presenting the unique interpretations, insights, creative processes, and artistic practices of select contemporary artists and art educators. The course emphasizes the visual, conceptual, and practical applications of contemporary art practices in today's K-12 schools. The course provides engaging activities and projects that aim to provoke, inspire, and stimulate pre-service art education students to become innovators in their future art classrooms.

ARED 2050. STEAM Studio.

Studio 4. Credit 2.

Prerequisite: ARED 2020. Exploration and defining STEAM through experiencing the intersections of art and science through historical connections, campus collaborations, and studio projects.

ARED 3155. Elementary Practicum.

Lab. 1. Credit 1.

Prerequisite: ARED 2020 and ARED 3200. Corequisite: ART 3205. This practicum is to prepare art education students for their Residency I and II requirements in the senior year. Students will be required to spend at least 20 hours in a public school elementary art environment.

ARED 3165. Secondary Practicum.

Lab. 1. Credit 1.

Prerequisite: ARED 2020, ARED 3155, ARED 3200 and ART 3205. This practicum is to prepare art education students for their Residency I and II requirements in the senior year. Students will be required to spend at least 20 hours in a public school secondary art environment.

ARED 3200. Art Applications.

Lec. 1. Credit 1.

This course is designed for pre-service elementary classroom teachers to become involved in the arts and a hybrid experience including multi-module learning styles of online and face-to-face, on-campus (F2F) sessions. A holistic arts-approach will assist students in understanding the interaction within the combination of the hybrid networks. These networks utilize the asynchronous/synchronous tools that enable real-time communications and collaboration. This course authentic stimuli focuses upon the utilization of multiple constructivist theorist. The theories are based upon the argument that humans generate knowledge and meaning through self-regulation during the interaction between their experiences and ideas.

ARED 3210. Secondary Art Education.

Lec. 1. Studio 1. Field Exp. 1. Credit 3.

Prerequisite: Admission to the Teacher Education Program, ARED 2020. Materials and methods of teaching art in Grades 7-12.

ARED 3220. Teaching Art Appreciation in the Schools.

Lab. 1. Field Exp. 1. Credit 2.

Prerequisite: ARED 2020. The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Methods of teaching art appreciation in the public schools, Grades K-12.

ARED 3800. Field Experiences in Education.

Credit 2.

Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Supervised experiences in the public schools introducing program planning on elementary and secondary levels.

ARED 3810. Field Experiences in Education.

Credit 2.

Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: ARED 3210. Supervised experiences in the public schools introducing program planning on elementary and secondary levels.

ARED 4870. Student Teaching I.

Credit 5.

Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: ARED 4880 and ARED

4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom. A grade of B is required to meet degree requirements.

ARED 4871. Residency I. Credit 5.
Corequisite: ARED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

ARED 4872. Professional Seminar I. Credit 5.
Corequisite: ARED 4871. Seminar for Residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

ARED 4880. Student Teaching II. Credit 5.
Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: ARED 4870 and ARED 4890. Continuation of ARED 4870 in a different setting. A grade of B is required to meet degree requirements.

ARED 4881. Residency II. Credit 10.
Prerequisite: ARED 4871 with a grade of B. Corequisite: ARED 4882. Performance-based full-time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

ARED 4882. Professional Seminar II. Credit 2.
Corequisite: ARED 4881. Seminar for Residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

ARED 4890. Seminar: Education and Society. Credit 2.
Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: ARED 4870 and ARED 4880. Seminar on the interrelationships among school, culture and society; a historical, philosophical and sociological analysis.

Art (ART)

◆**ART 1035. Introduction to Art.** Credit 3.
Introduction to the understanding and appreciation of art. Emphasis on language of art, its application, and experiencing various art forms.

ART 1045. Drawing I. Studio 6. Credit 3.
Introduction to techniques and media of drawing, including two-dimensional and illusionistic skills.
(ARTP 1010, TTP Course)

ART 1050. Drawing II. Studio 6. Credit 3.
Prerequisite: ART 2310 or consent of instructor. Refinements of basic techniques with emphasis on individual development.
(ARTP 1020, TTP Course)

ART 1340. Foundations Studio I. Studio 6. Credit 3.
Introduction to the elements and principles of design in two-dimensions through studio projects, lectures, demonstrations and discussion.
(ARTP 1110, TTP Course)

ART 1350. Foundations Studio II. Studio 6. Credit 3.
Introduction to the elements and principles of design in three-dimensions through studio projects, lectures, demonstrations and discussion.
(ARTP 1120, TTP Course)

ART 2000. Art History I. Lec. 3. Credit 3.
Survey of painting, sculpture and architecture from prehistoric through medieval.
(ARTH 2010, TTP Course)

ART 2020. Art History II. Lec. 3. Credit 3.
Survey of painting, sculpture and architecture from Renaissance through the nineteenth century.
(ARTH 2020, TTP Course)

ART 2040. Printmaking: Relief. Studio 4. Credit 2.
Prerequisite: ART 1045 and ART 1340 or consent of instructor. Introduction to relief printmaking techniques with concentrated work in the processes of wood cut and linoleum cut.

ART 2080. Special Problems in Printmaking. Studio 2. Credit 1.
Prerequisite: ART 1045 or consent of instructor. Corequisite: ART 2040. Required for BFA majors with concentrations in Painting. Special studies in printmaking, which emphasize skills and artistic development of the professional artist.

ART 2090. Special Problems in Photography.

Studio 2. Credit 1.

Corequisite: ARED 2050. Required for BFA majors with Painting concentrations. Special studies in photography, which emphasize skills and artistic development for the professional artist.

ART 2210. Introduction to Design.

Studio 6. Credit 3.

Prerequisite: ARED 1250 or consent of instructor. An introduction to the principles and requirements of digital artwork for reproduction. Basic processes and standard software for digital design in raster and vector image files, and page layout processes are covered.

ART 2220. Typography, Text and Image.

Studio 6. Credit 3.

Prerequisite: ARED 1250 or consent of instructor. Introduction to type and the history of letterforms. Design with letterforms in blocks of text and page structure. Interaction of typography with content and the relation of typography to imagery.

ART 2330. Technical Drawing. Studio 6. Credit 3.

This class will focus on graphic techniques that are used in solving design problems, visually communicating ideas, and documenting precise information by drawing both with instruments and freehand.

ART 2340. Computer Aided Drafting for the Artist.

Studio 6. Credit 3.

Using CAD software, students will learn processes for designing, modeling and rendering three dimensional art objects.

ART 2410. Painting I, Introduction.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045 or permission of the instructor. Introduction to techniques, media, pictorial devices and color theory.

ART 2510. Introduction to Clay. Studio 6. Credit 3.

Introduction to hand-built and wheel-thrown clay vessels and sculpture, including historical and contemporary overview.

ART 2610. Introduction to Fibers.

Studio 6. Credit 3.

Introduction to the basics of surface design (dyeing and patterning fabric) and weaving cloth on a floor loom. Emphasis on developing the understanding of safe and successful methods of weaving cloth and patterning fabric.

ART 2710. Introduction to Glass.

Studio 6. Credit 3.

Beginning glassblowing for both majors and non-majors.

Vessels and paperweights made at the furnace and coldworking techniques such as stained glass, sandblasting, grinding and polishing. Modern use of glass and basics of the history of glass will also be covered.

ART 2810. Introduction to Metals.

Studio 6. Credit 3.

Introduction to the basics of metalworking. Emphasis on fabricated jewelry, design and creativity.

ART 2910. Introduction to Woodworking.

Studio 6. Credit 3.

Introduction to the basics of woodworking design and technology using hand and power tools.

ART 3099. Professional Practices for the Artist.

Lec. 3. Credit 3.

Prerequisite: ART 1340, ARED 1250, ART 1350, ART 1045, ART 1050 or ART 2330 and at least 6 credits of other art studio classes, or permission of the instructor. Students will research and learn to apply basic professional practices of the artist, including: business practices, marketing/promotion approaches, and identifying, applying for and utilizing resources available to artists. These skills will be used for advancing students' careers as emerging artists or preparing them for further study in the visual arts. This investigation will occur through reading and discussion, visiting presenters, writing, research projects/exercises, and development of individual portfolios.

ART 3130. Art Since 1900.

Lec. 3. Credit 3.

A survey of the major movements in western Art History from the late 19th century through the present. It is recommended but not required that students take ART 2120 before taking ART 3130.

ART 3150. History of Crafts I.

Lec. 3. Credit 3.

Survey of prehistoric through ancient crafts of the Mediterranean civilizations and the crafts of India, China, Japan, Africa, Native America and Islam.

ART 3160. History of Crafts II.

Lec. 3. Credit 3.

Survey of crafts from the Medieval Period through the present. It is recommended but not required that students take ART 3150 before taking ART 3160.

ART 3205. Methods and Media.

Lec. 1. Studio 1. Credit 2.

Prerequisite: ARED 2020 and ARED 3200. The course is structured to provide art education majors with opportunities to constructively develop and apply their knowledge and skills in the theory and practice of teaching the visual arts. This holistic-arts educational methods course emphasizes the integration of the visual

arts media within cross-disciplines to be practiced in the public/private section of learning institutions.

ART 3210. Design Studio. Studio 6. Credit 3.
Prerequisite: ART 2210 and ART 2220 or consent of instructor. Concept development and design problems in the development of still images, as well as applying more extensive capabilities of raster, vector and page layout software.

ART 3220. Design Studio II. Studio 6. Credit 3.
Prerequisite: ART 3210 or consent of instructor. Projects developing more advanced and complex production techniques, design problems and conceptual skills. Continuing development of advanced software skills.

ART 3230. Design Studio III. Studio 6. Credit 3.
Prerequisite: ART 3220 or consent of instructor. Projects developing visual communication strategies, design coherence, technical mastery, and an understanding of production requirements. Explores ethical issues and copyright and licensing requirements for publication in print and online formats.

ART 3240. Illustration and Visual Narrative. Studio 6. Credit 3.
Prerequisite: ART 3210 or consent of instructor. An introduction to the concepts of digital illustration using vector graphic software. Development of narrative concepts and visual continuity.

ART 3250. Independent Studies in Design. Studio 2-6. Credit 1-3.
Prerequisite: Consent of instructor. Directed projects in digital media arranged between the student and the instructor. May be repeated up to 9 credits.

ART 3251 Independent Studies in Design. Credit 1-3.
Prerequisite: Consent of the instructor. Directed projects in design arranged between the student and instructor.

ART 3310. Drawing III. Studio 6. Credit 3.
Prerequisite: ART 1050 or consent of instructor. Refinement of basic techniques with emphasis on individual development.

ART 3320. Figure Studies. Studio 6. Credit 3.
Prerequisite: ART 2320 or consent of instructor. Specific concepts in drawing and/or painting the human form, including gesture and expression, spatial structure and proportion, and the effects of light and drapery on the human form.

ART 3410. Painting II. Studio 6. Credit 3.
Prerequisite: ART 2410 or consent of instructor. Emphasis on problems in painting and use of materials in expressing the student's ideas.

ART 3420. Painting III. Studio 6. Credit 3.
Prerequisite: ART 1350, ART 1050, ART 3410 or consent of instructor. A continuation of studio painting, with emphasis on more advanced techniques, content, and the emergence of individual styles. May be repeated up to 6 credit hours.

ART 3421. Painting IV. Studio 6. Credit 3.
Prerequisite: ART 3420 or consent of instructor. A continuation of studio painting with emphasis on more advanced techniques, content, and the emergence of individual styles. May be repeated up to 6 credit hours.

ART 3430. Independent Studies in Painting I. Studio 6. Credit 3.
Prerequisite: ART 3421 or consent of instructor. Directed study in painting arranged between the instructor and the student.

ART 3431. Independent Studies in Painting II. Studio 6. Credit 3.
Prerequisite: ART 3430 or consent of instructor. Directed study in painting arranged between the instructor and the student.

ART 3510. Clay on the Wheel.-Fall. Studio 6. Credit 3.
Prerequisite: ART 1340, ART 1045, ART 2510 or permission of instructor. Exploration of wheel-throwing with emphasis on decorating and firing, including historical and contemporary overview. May be repeated up to 12 credit hours.

ART 3511. Intermediate Hand-building.-Spring. Studio 6. Credit 3.
Prerequisite: ART 1340, ART 1045, ART 2510 or permission of instructor. Further exploration of hand-building with emphasis on decorating and firing. May be repeated up to 12 credit hours.

ART 3520. Advanced Clay Studio.-Fall. Studio 6. Credit 3.
Prerequisite: ART 1350, ART 1050 or ART 2330 and ART 3510 or ART 3511, or permission of instructor. Advanced ceramic form and process with emphasis on individual stylistic concept. Additional emphasis on ceramic history, aesthetics and criticism. May be repeated up to 12 credit hours.

ART 3521. Advanced Clay Studio.-Spring. Studio 6. Credit 3.
Prerequisite: ART 1350, ART 1050 or ART 2330 and

ART 3510 or ART 3511 or permission of instructor. Advanced ceramic form and process with emphasis on individual stylistic concept. May be repeated up to 12 credit hours.

ART 3530. Independent Studies in Clay.

Lab. 2, 4, 6. Credit 1, 2, 3.

Prerequisite: ART 2510 or equivalent and permission of instructor. Independent production studies by arrangement with the instructor, emphasis on advanced creative design and skills. May be repeated up to 12 credit hours.

ART 3531. Independent Studies in Clay.

Lab. 2, 4, 6. Credit 1, 2, 3.

Prerequisite: ART 2510 or equivalent and permission of instructor. Independent production studies by arrangement with the instructor, emphasis on advanced creative design and skills. May be repeated up to 12 credit hours.

ART 3610. Weaving I.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045, ART 2610 or permission of instructor. Focus is on strengthening the student's technical knowledge and design capabilities of woven fiber structures, mainly for wearables and home furnishings. Explore various yarns to create interesting cloth. Learn several weave structures through samplers that include double weave cloth, lace waves, twill, and color and weave effects. May be repeated up to 12 credit hours.

ART 3611. Weaving II.

Studio 6. Credit 3.

Prerequisite: ART 1350, ART 1050 or ART 2330 and ART 3610 or permission of instructor. Explore more complex double weave structures and how to design interesting fabric with structure in mind. Explore new ways of thinking about cloth that includes weaving with more contemporary fiber. Emphasis is on transforming one's design concepts into woven work that is sound in structure, visually exciting, and contemporary in design. May be repeated up to 12 credit hours.

ART 3620. Surface Design I.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045, ART 2610 or permission of instructor. Develop skills in a variety of surface application techniques using natural fabrics and Fiber Reactive dyes. Application methods include painting, block printing, dextrin resist, vinyl transfer, discharge and devore. Emphasis is placed on how to use these surface techniques to create unique and visually dynamic designs. May be repeated up to 12 credit hours.

ART 3621. Surface Design II.

Studio 6. Credit 3.

Prerequisite: ART 1350, ART 1050 or ART 2330, and ART 3620 or permission of instructor. Screen-printing for

repeat pattern on yardage and large-scale fabric work with emphasis on developing technical skill and a personal design aesthetic. Explore designs and design materials, learn methods for putting a design into repeat, and register print to produce an all-over multi-colored image on fabric. May be repeated up to 12 credit hours.

ART 3630. Independent Studies in Fibers.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual fibers projects with emphasis on concept and design in weaving or surface design. May be repeated up to 12 credit hours.

ART 3631. Independent Studies in Fibers.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual fibers projects with emphasis on concept and design in weaving or surface design. May be repeated up to 12 credit hours.

ART 3710. Intermediate Glass Studio.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045, ART 2710 or permission of instructor. Intermediate glassblowing and coldworking, introduction to mold making, and exposure to a variety of professional artists' work. May be repeated up to 12 credit hours.

ART 3711. Intermediate Glass Studio.

Studio 6. Credit 3.

Prerequisite: ART 2710 or permission of instructor. Intermediate glassblowing and coldworking, introduction to mold making, and exposure to a variety of professional artists' work. May be repeated up to 12 credit hours.

ART 3720. Advanced Glass Studio.

Studio 6. Credit 3.

Prerequisite: ART 1350, ART 1050 or ART 2330 and ART 3710 and ART 3711 or permission of instructor. Advanced glassblowing and sandblasting, etching, slumping, and different types of glass forming. May be repeated up to 12 credit hours.

ART 3721. Advanced Glass Studio.

Studio 6. Credit 3.

Prerequisite: ART 1350, ART 1050 or ART 2330 and ART 3710 and ART 3711 or permission of instructor. Advanced glassblowing and sandblasting, etching, slumping, and different types of glass forming. May be repeated up to 12 credit hours.

ART 3730. Independent Studies in Glass.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual studies in glass through specific projects arranged between the instructor and the student. May be repeated up to 12 credit hours.

ART 3731. Independent Studies in Glass.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual studies in glass through specific projects arranged between the instructor and student. May be repeated up to 12 credit hours.

ART 3810. Metals Studio—Metalsmithing.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1350, ART 1045, ART 2320 or ART 2330 and ART 2810 or permission of instructor. The techniques and aesthetics of metalsmithing; emphasis on manipulation of sheet metal for jewelry and holloware with studies in casting, non-ferrous forging, chasing, raising and other techniques. May be repeated up to 12 credit hours.

ART 3811. Metals Studio—Metalsmithing.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 2010, ART 2310, ART 2320 or ART 2330 and ART 2810 or permission of instructor. The techniques and aesthetics of metalsmithing; emphasis on manipulation of sheet metal for jewelry and holloware with studies in casting, non-ferrous forging, chasing, raising and other techniques. May be repeated up to 12 credit hours.

ART 3820. Metals Studio—Blacksmithing.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045 and ART 2810, or permission of instructor. This course focuses on steel as a decorative, functional and sculptural material. Technical assignments exploring traditional blacksmithing techniques progress to the development of an individual's style of work. May be repeated up to 6 credit hours.

ART 3821. Metals Studio—Blacksmithing.

Studio 6. Credit 3.

Prerequisite: ART 1350, ART 1050 or ART 2330, and ART 3820, or permission of instructor. Continuing development in steel as a decorative, functional and sculptural material. Technical assignments exploring traditional blacksmithing techniques progress to the development of an individual's style of work. May be repeated up to 6 credit hours.

ART 3830. Independent Studies in Metals.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Independent production studies and emphasis on advanced creative design and skills in either light metals or blacksmithing. May be repeated up to 12 credit hours.

ART 3831. Independent Studies in Metals.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Independent production studies and emphasis on advanced creative design and skills in either light metals or blacksmithing. May be repeated up to 12 credit hours.

ART 3910. Intermediate Wood Studio.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045, ART 2910 or permission of instructor. Studies in the techniques of woodworking, furniture construction, and design. Hand and power tools, joinery, bending, stack lamination, turning, carving and finishing. May be repeated up to 12 credit hours.

ART 3911. Intermediate Wood Studio.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1045, ART 2910 or permission of instructor. Studies in the techniques of woodworking, furniture construction, and design. Hand and power tools, joinery, bending, stack lamination, turning, carving and finishing. May be repeated up to 12 credit hours.

ART 3920. Advanced Wood Studio.

Studio 6. Credit 3.

Prerequisite: ART 1340, ART 1050 or ART 2330 and ART 3910 and ART 3911 or permission of instructor. Studies in advanced woodworking construction. Emphasis on cabinetry or seating, ergonomics, structure and design. May be repeated up to 12 credit hours.

ART 3921. Advanced Wood Studio.

Studio 6. Credit 3.

Prerequisite: ART 1350, ART 1050 or ART 2330 and ART 3910 and ART 3911 or permission of instructor. Studies in advanced woodworking construction. Emphasis on cabinetry or seating, ergonomics, structure and design. May be repeated up to 12 credit hours.

ART 3930. Independent Studies in Woodworking.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual approaches to working in wood through specific projects arranged with the instructor. May be repeated up to 12 credit hours.

ART 3931. Independent Studies in Woodworking.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual approaches to working in wood through specific projects arranged with the instructor. May be repeated up to 12 credit hours.

ART 3940. Woodturning.

Studio 6. Credit 3.

Principles and applied skills of spindle, faceplate, bowl and end grain turning.

ART 4040. Art Criticism and Aesthetic Understanding.

Credit 3.

Prerequisite: Successful completion of 3000 level studio classes. Aesthetic theories and criticism as related to craft material and concepts.

ART 4100. Art Tour.

Credit 3.

Prerequisite: Standing as a declared BFA major or ART 1035 or consent of instructor. A 1-2 week trip to view internationally recognized art. Additional preparatory studies and written assignments will be required. May be repeated for credit if trip is different.

ART 4170. Ancient Mesoamerican Art.

Lec. 3. Credit 3.

Art and architecture of Pre-Columbian Mesoamerican cultures, including Olmec, Maya, Teotihuacan, Monte Alban, Veracruz, Mixtec and Aztec.

ART 4211. Design Practicum.

Studio 6. Credit 3.

Prerequisite: ART 3230 or permission of instructor. Guided projects developing specific visual communications solutions to real world problems, addressing individual, organizational or service learning opportunities. Project proposal, assessment and evaluation schedule to be approved by the instructor prior to enrollment.

ART 4221. Design Internship.

Studio 6. Credit 3.

Prerequisite: ART 4211, ART 4231 or permission of instructor. Guided projects developing specific visual communications solutions to real world problems, addressing individual, organizational or service learning opportunities. Project proposal, assessment and evaluation schedule to be approved by the instructor prior to enrollment.

ART 4230. Design Portfolio.

Credit 4.

Prerequisite: ART 4240 or consent of the instructor. Development and presentation of a professional quality portfolio of artwork and projects in digital media.

ART 4231. Design Portfolio I.

Studio 6. Credit 3.

Development and presentation of a professional quality portfolio of artwork and projects in digital media.

ART 4232. Design Portfolio II.

Studio 6. Credit 3.

Prerequisite: ART 4230. Continued development and presentation of a professional quality portfolio of artwork and projects in digital media.

ART 4240. Special Problems in Design.

Studio 8. Credit 4.

Prerequisite: ART 3210 or consent of the instructor. Targeted application of digital media skills to content development and problem solving in individual and team design projects.

ART 4310. Independent Studies in Drawing I.

Studio 6. Credit 3.

Prerequisite: Permission of the instructor. Directed study in selected drawing media in specific projects arranged between the instructor and the student.

ART 4311. Independent Studies in Drawing II.

Studio 6. Credit 3.

Prerequisite: Permission of the instructor. Directed study in selected drawing media in specific projects arranged between the instructor and the student.

ART 4410. Senior Thesis in Painting.

Credit 1-6. Max. 18.

Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4510. Senior Thesis in Clay.

Credit 1-6. Max. 18.

Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4540. Special Problems in Clay.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: ART 3510, ART 3511 and permission of the instructor. Periodic advanced studio/lecture courses covering special topics not addressed in regular course offerings. May be repeated up to 12 credit hours.

ART 4610. Senior Thesis in Fiber.

Credit 1-6. Max. 18.

Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual and design accomplishment in a stylistically coherent

body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4640. Special Problems in Fibers.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: ART 2610 or permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4710. Senior Thesis in Glass.

Credit 1-6. Max. 18.

Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4740. Special Problems in Glass.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4810. Senior Thesis in Metals.

Credit 1-6. Max. 18.

Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A twelve credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4840. Special Problems in Metals.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4910. Senior Thesis in Wood.

Credit 1-6. Max. 18.

Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in the required final exhibition. May be repeated up to 18 credit hours.

ART 4940. Special Problems in Wood.

Studio 2, 4, 6. Credit 1, 2, 3.

Prerequisite: Permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4950, 4960, 4970. Special Problems in Art.

Credit 1-3. Max. 9.

Individual study on a topic agreed upon by the instructor and the student.

◆ **Meets Tennessee Technological University general education requirements (Humanities/Fine Arts).**

Astronomy (ASTR)

◆ **ASTR 1010. Introduction to Modern Astronomy.- Fall, Spring.**

Lec. 3. Lab. 2. Credit 4.

Prerequisite: Background knowledge of high school Algebra and Geometry. Studies of the solar system, stars, and galaxies; recent advances in astronomy and astrophysics; and quasars, pulsars, black holes, cosmological theories, space exploration; non-technical survey of the principles of optics, and atomic and nuclear physics as applied to astronomy.

◆ **ASTR 1020. Introduction to Modern Astronomy.- Fall, Spring.**

Lec. 3. Lab. 2. Credit 4.

Prerequisite: Background knowledge of high school Algebra and Geometry. Studies of the solar system, stars, and galaxies; recent advances in astronomy and astrophysics; and quasars, pulsars, black holes, cosmological theories, space exploration; non-technical survey of the principles of optics, and atomic and nuclear physics as applied to astronomy.

◆ **Meets Tennessee Technological University general education requirements (Natural Sciences).**

Biology (BIOL)

BIOL 1000. Introduction to Biological Methods.

Lec. 0. Lab. 2. Credit 1.

An introduction and orientation to the literature, research and computing skills utilized in the life sciences.

◆ **BIOL 1010. Introduction to Biology.**

Lec. 3. Lab. 2. Credit 4.

Introduction to concepts of biology and their relationships to current and future social problems. Non-biology majors only. Credit will not be given for both BIOL 1010 and BIOL 1113.

◆ **BIOL 1020. Diversity of Life.**

Lec. 3. Lab. 2. Credit 4.

Note: BIOL 1010 is not a prerequisite. Survey of plant and animal diversity, introductory ecology, and man's impact on the environment. Non-biology majors only.

◆BIOL 1080. Concepts of Biology.

Lec. 2. Lab. 2. Credit 3.

Basic concepts of biology including botany, zoology, and environmental applications. This course will not count as a part of a biology sequence.

◆BIOL 1113. General Biology I.

Lec. 3. Lab. 2. Credit 4.

A basic foundation in biological principles common to all organisms with an emphasis on molecules, cells and organelles, respiration, photosynthesis, metabolism and enzymatic function, genetics and inheritance, cellular reproduction, evolution, and speciation. Credit will not be given for both BIOL 1113 and BIOL 1010.

BIOL 1123. General Biology II.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: BIOL 1113 is highly recommended.

Introduction to the principles of Zoology.

BIOL 2000. Biological Terminology.

Lec. 1. Credit 1.

An introduction to biological terminology, including zoological, botanical, ecological, and medical terminology, with an emphasis on developing proficiency with the use of word roots and derivations.

◆BIOL 2010. Human Anatomy and Physiology I.

Lec. 3. Lab. 2. Credit 4.

Structure and function of the human body for nursing and other majors requiring a detailed examination of the topic. First course in a two course sequence. (See BIOL 2020.)

◆BIOL 2020. Human Anatomy and Physiology II.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: BIOL 2010. Continuation of BIOL 2010.

BIOL 2310. General Botany.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: It is highly recommended that students wait until their Sophomore year to take this course. This course addresses the life cycles, morphology, and phylogeny of major clades of organisms, with an emphasis on fungi, protists, and plants.

BIOL 2350. Introductory Anatomy and Physiology.

Lec. 3. Lab. 2. Credit 4.

An introductory course in human anatomy and physiology intended for students of health and physical education, human ecology, psychology, and other majors requiring a basic survey of the topics.

BIOL (WFS) 2991. Topics.

Credit 1.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two,

three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL (WFS) 2992. Topics.

Credit 2.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL (WFS) 2993. Topics.

Credit 3.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL (WFS) 2994. Topics.

Credit 4.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL 3040. Comparative Vertebrate Anatomy.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: BIOL 1113 and BIOL 1123. Anatomy and phylogeny of vertebrates and comparative study of systems of representative types.

BIOL 3060. Comparative Vertebrate Embryology.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: BIOL 3140 or BIOL 3040. Gametes, fertilization, cleavage, and gastrulation. Derivatives of the germ layers and organ systems in representative vertebrates.

BIOL 3100. Genetics (TN eCampus Course).

Credit 3.

Prerequisite: BIOL 1123 and BIOL 2310. Basic principles

of traditional transmission genetics, as well as modern molecular genetics, delivered via PowerPoint presentations with an audio component. Note: This course is for teachers seeking a Biology Add-on Endorsement; it will not substitute for required genetics courses in Biological Sciences or related majors.

BIOL 3120. General Ecology. Lec. 3. Credit 3.
The relationship between plants and animals and their environment. This course cannot be taken as part of the university science requirement and credit will not be given for both BIOL 3120 and BIOL/WFS 3130.

BIOL 3130. General Ecology. Lec. 3. Lab. 3. Credit 4.
The relationship between plants and animals and their environment. The laboratory provides examples of concepts discussed in lecture and analytical procedures used in interpreting data. (Same as WFS 3130.)

BIOL 3140. Cellular Biology. Lec. 3. Lab. 2. Credit 4.
Prerequisite: BIOL 1114. An introduction to structure and function of cells.

BIOL 3200. General Microbiology. Lec. 2. Lab. 4. Credit 4.
Prerequisite: BIOL 1123. Introduction to basic concepts of microbiology (non-medical). Intended for students not in health-science programs. Credit will not be given for both BIOL 3200 and BIOL 3230.

BIOL 3230. Health Science Microbiology. Lec. 3. Lab. 3. Credit 4.
Prerequisite: Sophomore standing. Introduction to microbiology. Intended for students majoring in nursing or other preprofessional programs. Credit will not be given for both BIOL 3200 and BIOL 3230.

BIOL 3240. Field Botany. Lec. 2. Lab. 3. Credit 3.
Prerequisite: BIOL 2110 and Junior Standing. Survey of regional flora (herbs, shrubs, & trees) focusing on gymnosperms and angiosperms. Emphasis on nomenclature, structural characteristics, identification of species using a dichotomous key, and characteristics of plant families.

BIOL 3330. Entomology. Lec. 2. Lab. 2. Credit 3.
Common harmful and beneficial insects of this region and their control.

BIOL 3530. Animal Physiology. Lec. 3. Credit 3.
Prerequisite: BIOL 1113 and BIOL 1123. General principles of animal function.

BIOL 3550. Ecology (TN eCampus Course). Credit 3.
Prerequisite: BIOL 1123 and BIOL 2310. Introduction to the basic concepts of ecology, and the study of organisms and their interactions with the environment delivered primarily via PowerPoint presentations. Note: This course is for teachers seeking a Biology Add-on Endorsement; it will not substitute for required ecology courses in Biological Sciences or related majors.

BIOL 3700. Humanism in Medicine. Lec. 3. Credit 3.
Prerequisite: Junior Standing. An introduction to ethics and humanism in medicine as a means of understanding the basic values and tenets of the medical profession. The course is especially designed for students who plan to become physicians, physical therapists, physician assistants, nurse practitioners, and related health-care professionals.

BIOL 3810. General Genetics. Lec. 3. Lab. 2. Credit 4.
Prerequisite: BIOL 1113. Principles and laws governing inheritance in plants and animals including man.

BIOL 3920. Biological Communication Skills. Lec. 3. Credit 3.
Prerequisite: Junior Standing. Locating and using resource materials, technical writing, and oral presentations in biological disciplines.

BIOL 4000 (5000). General Parasitology. Lec. 3. Lab. 2. Credit 4.
Prerequisite: BIOL 1123, BIOL 3120 or BIOL 3130 or WFS 3130. Biology of animal agents and vectors of diseases with emphasis placed on medical parasitology and organisms that parasitize fish and wildlife species.

BIOL 4040 (5040). Immunology. Lec. 3. Credit 3.
Prerequisite: Junior Standing. Introduction to basic principles of cellular and molecular immunology.

BIOL 4060 (5060). Hormones and Chemical Communication. Lec. 3. Credit 3.
Prerequisite: BIOL 3140 and CHEM 1110 or CHEM 1210. A survey of hormones, their functions and mechanisms of action in vertebrate animals, including humans.

BIOL 4100 (5100). Evolutionary Biology. Lec. 3. Credit 3.
Prerequisite: BIOL 3810 and BIOL 3130 or WFS 3130. Theories, evidences, principles, and examples of organic evolution. Emphasis on anatomical, chemical, ecological, geological, anthropological, and genetic factors.

BIOL 4120 (5120). Protozoology.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: BIOL 3200 or BIOL 3230. Diversity, ecology, and taxonomy of protozoa, and the importance of protozoa as agents of human disease and as model organisms for studying eukaryotic cell biology.

BIOL 4130 (5130). Environmental Microbiology.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: BIOL 3200 or BIOL 3230. The function of microorganisms in the environment.

BIOL 4140 (5140). Pathogenic Bacteriology.

Lec. 3. Credit 3.

Prerequisite: BIOL 3200 or BIOL 3230. Common bacterial pathogens will be reviewed, including: 1. How they cause disease; 2. Virulence factors and how they are identified and studied; and 3. Prevention of disease transmission.

BIOL 4150 (5150). Molecular Genetics.

Lec. 3. Credit 3.

Prerequisite: BIOL 3810, CHEM 3005 or CHEM 3020. Molecular basis of inheritance with special emphasis on microorganisms.

BIOL 4160 (5160). Genetic Engineering Laboratory.

Lab. 4. Credit 2.

Prerequisite or corequisite: BIOL 4150 (5150). Techniques of bacterial genetics and recombinant DNA methodology.

BIOL 4170 (5170). Population and Conservation Genetics.

Lec. 3. Credit 3.

Prerequisite: BIOL 1123 and BIOL 3810. Introduction to empirical and theoretical conservation genetics.

BIOL (WFS) 4220 (5220). Biostatistics.

Lec. 3. Credit 3.

Prerequisite: MATH 1530 or MATH 1830. Probability and frequency distribution; statistical populations and samples; and tests of hypotheses used in biological research.

BIOL 4230 (5230). Animal Behavior.

Lec. 3. Credit 3.

Prerequisite: Junior Standing. Introduction to basic principles underlying the behavior of animals. (Same as WFS 4230 (5230).)

BIOL 4240 (5240). Systematic Botany.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 3240. Principles of evolutionary relationships among major plant groups, with an emphasis on the phylogeny of gymnosperms and flowering plant families.

BIOL 4250 (5250). Economic Botany.

Lec. 3. Credit 3.

Prerequisite: BIOL 2310. Interrelationships between plants and people. Topics include a survey of the past, present, and future uses of plants and the role of conservation biology in the preservation of plant resources.

BIOL 4300 (5300). Plant Speciation and Evolution.

Lec. 3. Credit 3.

Prerequisite: BIOL 1123. Principles of the evolution of plants at the micro- and macroevolution levels, including a survey of relevant primary and secondary literature.

BIOL 4310 (5310). Plant Anatomy.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 2310 and Junior Standing. A comparative study of the structure of vascular plants in relation to function.

BIOL 4320 (5320). Plant Physiology.

Lec. 2. Lab. 3. Credit 3.

Physiological activities of seed plants, including photosynthesis, respiration, mineral nutrition, flowering, seed formation, and dormancy.

BIOL 4330 (5330). Plant Ecology.

Lec. 2. Lab. 3. Credit 3.

Prerequisites: BIOL 2110 and Junior Standing. Biotic and abiotic factors affecting the distribution and abundance of plant species and the role of plants in ecosystem structure and function.

BIOL 4340 (5340). Plant-Animal Interactions.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 2310 and junior standing. Interactions of plants and animals in aquatic, terrestrial, and atmospheric environments at various ecological scales.

BIOL 4610 (5610). Invertebrate Zoology.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: BIOL 3130 or WFS 3130. Biology of invertebrates with emphasis on morphology, systematics and ecology.

BIOL (WFS) 4630 (5630). Ornithology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. General survey of the class Aves with emphasis on morphology, identification and ecology of local birds.

BIOL (WFS) 4650 (5650). Marine Biology.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: BIOL 3130 or WFS 3130. An introduction to the study of the marine environment and marine organisms.

BIOL 4750 (5750). Medical Microbiology.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: BIOL 3200 or BIOL 3230. A survey of microorganisms of medical importance with emphasis on the bacteria and viruses. Principles of infectious disease, including diagnostic methods and treatments. Laboratory exercises demonstrating methods of isolating and identifying pathogenic microorganisms.

BIOL 4780 (5780). Phycology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Introduction to freshwater algae.

BIOL (WFS) 4810 (5810). Ichthyology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Identification, classification, anatomy, physiology, ecology and adaptations of fishes; emphasis on North American freshwater species.

BIOL (WFS) 4820 (5820). Mammalogy.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Classification, structure and function, phylogeny, and geographical distribution of mammals; emphasis on Tennessee mammals.

BIOL (WFS) 4830 (5830). Herpetology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Classification, adaptations, habits, life histories, and geographical distribution of amphibians and reptiles; emphasis on North American species.

BIOL (WFS) 4840 (5840). Limnology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Physiochemical and biological dynamics of inland water.

BIOL 4850 (5850). Applied Microbiology.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Consent of instructor. Microbial production of foods and chemicals; microorganisms in food spoilage.

BIOL 4900. Internship in Biology.

Credit 3.

See instructions prior to enrolling. Students work with a public agency or private company or organization that is compatible with their interest. (May be taken twice if the assignments are with different organizations or with different divisions with an organization.)

BIOL (WFS) 4991 (5991). Advanced Topics.

Credit 1.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the

life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL (WFS) 4992 (5992). Advanced Topics.

Credit 2.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL (WFS) 4993 (5993). Advanced Topics.

Credit 3.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

BIOL (WFS) 4994 (5994). Advanced Topics.

Credit 4.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

◆ **Meets Tennessee Technological University general education requirements (Natural Sciences).**

Gulf Coast Research Laboratory Program (MBIO)**MBIO 3000. Oceanography I: Physical, Chemical and Geological.-Summer.**

Credit 5.

Prerequisite: College Algebra and two semesters of Chemistry. Integration of chemical, geological, and physical oceanography to provide a multidisciplinary approach to the fundamentals of oceanography. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 3010. Oceanography II: Marine Biology.-Summer. Credit 5.
Prerequisite: Eight semester hours of Biology. General introduction to marine biology with emphasis on local fauna and flora. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4030 (5030). Marine Invertebrate Zoology.-Summer. Credit 6.
Prerequisite: 16 semester hours of Biology. Structure, classification, phylogeny, and function in Protozoa through the Lophophorata. Observation of their ecology and behavior. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4040 (5040). Parasites of Marine Animals.-Summer. Credit 6.
Prerequisite: BIOL 3200 or BIOL 3230 or consent of instructor. Morphology, taxonomy, life histories, and host-parasite relationships. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4050 (5050). Marine Ecology.-Summer. Credit 5.
Prerequisite: 16 semester hours of Biology, including General Zoology, General Botany, and Invertebrate Zoology. Relationship of marine organisms to their environment. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4060 (5060). Fauna and Faunistic Ecology of Tidal Marshes.-Summer. Credit 4.
Prerequisite: 16 semester hours of Biology and Junior Standing or consent of instructor. Taxonomy, distribution, trophic relationships, reproductive strategies, and adaptations. Emphasis on northern Gulf marshes. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4070 (5070). Marine Aquaculture.-Summer. Credit 6.
Prerequisite: 16 semester hours of Zoology, including Invertebrate and Vertebrate Zoology of Ichthyology. Technology, principles, and problems of aquaculture. Emphasis on marine species. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4080 (5080). Marine Ichthyology.-Summer. Credit 6.
Prerequisite: 12 semester hours of Biology and Junior Standing. Marine Chordata, including lower groups and the mammals and birds. Emphasis on fishes. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4090 (5090). Marine Microbiology.-Summer. Credit 5.
Prerequisite: BIOL 3200 or BIOL 3230 or consent of instructor. Sampling procedures, taxonomy of marine bacteria, mineralization, microbial, fouling, pollution, and diseases of marine animals. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4100 (5100). Marine Fisheries Management.-Summer. Credit 4.
Prerequisite: Consent of instructor. Overview of practical marine fishery management program. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4200 (5200). Marine Phycology.-Summer. Credit 4.
Prerequisite: Eight semester hours of Biology, including Introductory Botany or consent of instructor. Survey of the principal groups of marine algae and maritime flowering plants. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4210 (5210). Coastal Vegetation.-Summer. Credit 3.
Prerequisite: 10 semester hours of Biology, including General Biology. Aspects of coastal vegetation. Emphasis on local examples. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4220 (5220). Salt Marsh Plant Ecology.-Summer. Credit 4.
Prerequisite: General Botany, Plant Taxonomy, Plant Physiology, General Ecology or consent of instructor. Identification, composition, structure, distribution, primary productivity, ecology, and development. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4300 (5330). Comparative History of Marine Organisms.-Fall, Spring, Summer. Credit 1-6.
Prerequisite: Consent of instructor. Processing tissues using light, transmission electron, and scanning electron microscopy. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4410 (5410). Marine Chemistry.-Summer. Credit 6.
Prerequisite: 16 semester hours of Chemistry, three to six semester hours of Biology and Geology or consent of instructor. Chemical aspects of oceans and interactions of chemistry, biology, and geology in marine environments. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4440 (5440). Behavior and Neurobiology of Marine Animals.-Summer. Credit 4.

Prerequisite: 16 semester hours of Zoology and/or Psychology or consent of instructor. Behavior, neuroanatomy, and neurophysiology. Emphasis on neural mechanisms underlying behavior. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4570 (5570). Marine Science for Teachers.-Summer. Credit 3.

Prerequisite: Biology background or consent of instructor. Introduction to marine science for public school teachers. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4580 (5580). Marine Science for Elementary Teachers.-Summer. Credit 3.

Prerequisite: Six semester hours of Biology. Materials and methods in teaching marine science to elementary students. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4590 (5990). Special Problems in Marine Science.-Fall, Spring, Summer. Credit 1-6.

Prerequisite: To be set by problem director. Research oriented problems reported in writing. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4910 (5910). Special Topics in Marine Science.-Fall, Spring, Summer. Credit 1-6.

Prerequisite: To be set by topics advisor. Special study in a field topic approved by the GCRL Topics Advisor and the student's institutional advisor. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Business Law (LAW)

Enrollment in Junior- or Senior-level Law courses requires Junior Standing. All Business majors must have completed the Basic Business Program.

LAW 2810. Business Legal Environment and Ethics.

Lec. 3. Credit 3.

The legal aspects of the business environment including antitrust, administrative, consumer, and employment law; business organizations; and principles of contracts.

LAW 4720. Business Law. Lec. 3. Credit 3.

Law related to business practices and procedures, including personal property, bailments, sales, commercial paper, and legal aspects of organizing, operating, and terminating a business.

LAW 4900. Topics.

Lec. 3. Credit 3.

Prerequisite: Senior Standing or consent of instructor. Selected topics involving the legal environment. A student may take LAW 4900 twice provided the topic is different each time.

LAW 5100. Business Law and Legal Environment.

Lec. 3. Credit 3.

The basic legal instruments and legal principles comprising the legal environment of business, integrated with contemporary ethical, social, and political issues.

Business Management (BMGT)

Enrollment in Junior- or Senior-level BMGT courses requires Junior standing. All business majors must have completed the Basic Business Program.

BMGT 3510. Management and Organization Behavior.

Lec. 3. Credit 3.

Management functions and processes as applied to organizations with special emphasis on the behavioral aspects.

BMGT 3525. Internship in Management.

Lec. 3. Credit 3.

Prerequisite: Consent of Management Internship Coordinator or Department Chairperson, Junior or Senior Standing required. A directed professional experience in the field of Management.

BMGT 3600. International Management.

Lec. 3. Credit 3.

Prerequisite: BMGT 3510. Explore organization and management issues in international business.

BMGT 3630. Human Resource Management.

Lec. 3. Credit 3.

Prerequisite: BMGT 3510. Personnel management policies, practices, and laws.

BMGT 3720. Business Communication I.

Lec. 3. Credit 3.

Principles and practices in developing appropriate business messages that report primary and secondary research in a variety of styles.

BMGT 4100. Staffing.

Lec. 3. Credit 3.

Prerequisite: BMGT 3630. This course will focus on the recruitment, selection, and retention of human resources within organizations. Students will learn methods and processes by which organizations plan for their staffing needs, recruit applicants, select new employees, and socialize new employees. Students will also learn how the staffing function influences organizational performance and how the staffing function is influenced

by the legal, social, organizational, and technological environments in which staff decisions are made.

BMGT 4120 (5120). Compensation Administration.

Lec. 3. Credit 3.

Prerequisite: BMGT 3630. Theory and practice of determining wages, salaries, and employee benefits.

BMGT 4150. Employment and Labor Law.

Lec. 3. Credit 3.

Prerequisite: BMGT 3630. An overview of legal issues affecting the employment relationship in business, from a managerial perspective.

BMGT 4410 (5410). Conflict Management and Negotiation.

Lec. 3. Credit 3.

Prerequisite: BMGT 3630. Development of interpersonal skills for managing conflict and negotiations in business.

BMGT 4520 (5520). Organizational Leadership.

Lec. 3. Credit 3.

Prerequisite: BMGT 3510. An examination of behavioral concepts required for effective leadership within business organizations.

BMGT 4610. Training and Development.

Lec. 3. Credit 3.

Prerequisite: BMGT 3510. Development of skills in employee development and training in a wide range of business contexts.

BMGT 4720. Business Communication II.

Lec. 3. Credit 3.

Prerequisite: BMGT 3720. Analyzing and presenting solutions for cases and problems involving business transactions.

BMGT 4900. Special Topics in Management.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Current topics in management.

BMGT 4930 (5930). Business Strategy.

Lec. 3. Credit 3.

Prerequisite: BMGT 3510, FIN 3210 and MKT 3400.
Prerequisite or Corequisite: DS 3520. A capstone course stressing management problem analysis, problem solving, and decision-making.

BMGT 5150. Management and Organization.

Lec. 3. Credit 3.

Fundamentals of management that permeate organizations, including administrative structure and organizational environment, operations and organizational behavior.

Career Technical Education (CTE)

CTE 3230. Shop, Lab, and Classroom Organization for Career Technical Education.

Lec. 3. Credit 3.

Orientation to the safe and efficient management of classroom, shop, and lab facilities.

CTE 4030 (5030). Curricular and Program Development for Career Technical Education.

Lec. 3. Credit 3.

A study of the fundamental steps involved in the development of curriculum in industrial education.

CTE 4040 (5040). Advisory Committees in Industrial Education.

Lec. 3. Credit 3.

A study on how to effectively establish and utilize advisory committees for student programs in industrial education.

CTE 4050 (5050). Academic and Vocational Interdependence.

Lec. 3. Credit 3.

A study on how to infuse the academic and vocational programs into a unified educational delivery system.

CTE 4060 (5060). Safety in Industrial Education.

Lec. 3. Credit 3.

A study of the safety requirements associated with the provision of a safe learning environment in industrial education.

CTE 4070 (5070). History and Philosophy of Industrial Education.

Lec. 2. Credit 2.

History of industrial education in the United States and special focus on the development of a personal philosophy of industrial education.

CTE 4080 (5080). Career Technical Student Organizations and Teaching Supervision.

Lec. 3. Credit 3.

The methods of establishment, supervision and evaluation of vocational youth organizations in industrial education.

CTE 4090 (5090). Career Technical Education for Students with Special Needs.

Lec. 3. Credit 3.

Overview of the nature of special needs students, technique of modification of vocational curriculum, and development of appropriate teaching materials.

CTE 4850 (5850). Use of Technology in Career Technical Education.

Credit 1-3.

Laboratory approach providing opportunities for experienced educational personnel to concentrate their study in depth.

Chemical Engineering (CHE)

CHE 1010. Introduction to Chemical Engineering.

Lec. 1. Credit 1

Prerequisite: Freshman Standing. Information is provided to potential chemical engineering majors in a variety of areas including: curriculum linkages, the profession, collaborative work environments, faculty interaction, mentoring opportunities, professional societies, and laboratory skills.

CHE 1020. Processes, Products and Ethics.

Lec. 1. Credit 1.

Professionalism and Ethics are central in the practice of Engineering. Fundamental program outcome addressed formally in this course and applied throughout the curriculum in various manners.

CHE 2010. Introduction to Chemical Engineering Analysis.

Lec. 3. Credit 3.

Prerequisite: ENGR 1120, CHEM 1120 and MATH 1910. Quantitative descriptions of chemical engineering systems. Conservation equations, rate processes, and mathematical analysis.

CHE 2015. Introduction to Chemical and Biological Process Analysis and Scaling I.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ENGR 1120 and MATH 1920. May be taken concurrently. Introduction to basic concepts of chemical engineering including unit analysis, balance concepts and various mathematical tools including use of software such as Excel, MatLab and Visual Basic.

CHE 2020. Introduction to Chemical and Biological Process Analysis and Scaling II.

Lec. 2 Lab. 2. Credit 3.

Prerequisite: ENGR 1120, C or better in CHE 2015, MATH 1920, and CHEM 1120. Quantitative descriptions of chemical and biological engineering systems. Conservation of mass and energy for single and multi-process units as well as for reactive and non-reactive systems. Lab introduces report writing and basic measurement techniques.

CHE 3010. Thermodynamics of Chemical Processes.

Lec. 3. Credit 3

Prerequisite: CHE 2015. Minimum grade of C. CHE 2020, MATH 2110, and MATH 2120. Application of the 1st and 2nd Laws of Thermodynamics to the analysis of single and multi-phase processes for both closed and open systems.

CHE 3021. Separations and Solution Thermodynamics.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: CHE 3010 or equivalent. Analysis and prediction of mixture properties at equilibrium in single

and multiple phases. Lab is focused on solution thermodynamic topics and industrially-relevant separation processes.

CHE 3111. Transfer Science I: Conduction, Radiation, and Diffusion.

Lec. 3. Lab. 2. Credit 4

Prerequisite: CHE 2020, MATH 1920 and MATH 2120. Energy and mass conservation principles. Experimental studies of heat and diffusive mass transfer. Design and operation of systems for heat and mass transfer with applications to heat exchange and diffusive motion. CHE 2011 and MATH 2120 may be taken concurrently.

CHE 3121. Transfer Science II: Fluid Mechanics.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: MATH 2110 and CHE 2020. Corequisite: MATH 2120. Theory of mass and momentum conservation principles. Experimental studies of fluid mechanics. Design and operation of systems involving fluids with application to fluid flow and fluid property measurements. MATH 2110 may be taken concurrently with permission from the department.

CHE 3730. Chemical Engineering Operations.

Lec. 3. Credit 3

Prerequisite: CHE 2015. Minimum grade of C. Decision-making techniques as applied to management of chemical processing plants.

CHE 3990. Introduction to Research Methods.

Lab. 2. Credit 1.

Prerequisite: Consent of instructor. Introduces students to research methods used within chemical engineering.

CHE 4131 (5131). Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer.

Lec. 3. Lab. 2. Credit 4

Prerequisite: CHE 3010, CHE 3021 and CHE 3121. Mathematical description of diffusion and diffusive-convective mass transfer. Mass transfer with reaction. Dimensional Analysis. Mass transfer in one and two-dimensions in Cartesian, cylindrical, and spherical coordinates. Integrated labs demonstrating the concept of diffusion, computational experiments, and demonstrating the effect of geometry, flow, etc., on mass transfer.

CHE 4210 (5210). Chemical Reaction Engineering.

Lec. 3. Lab. 1. Credit 4.

Prerequisite: CHE 3021 and CHE 3121. Chemical reaction kinetics and chemical reactor design. There is an emphasis on homogeneous reactions and ideal and non-ideal reactors. Introduction to laboratory experiments to illustrate typical situations found in chemical reacting systems: kinetics parameter determination, residence time visualization, introduction

to different types of reactors (i.e., batch, tubular and gradientless.)

CHE 4240. Chemical Engineering Capstone Project.

Lab. 3. Credit 1

Prerequisite: CHE 3111, CHE 3121, CHE 4131, CHE 3010, CHE 3021, CHE 4410, CHE 4420, CHEM 3010, CHEM 3020 or consent of instructor. Project serves as a culminating experience for the student. Project content varies depending on the interests of the student, project team, and project sponsors. Projects serve to integrate junior and senior level coursework, promote an understanding of team dynamics and the development of project management skills.

CHE 4245. Clinical Immersion. Ind. 3. Credit 3.

Prerequisite: Junior or Senior standing in chemical engineering or other engineering discipline, or consent of the instructor. This course focuses on team-based identification of unmet medical needs and development of robust solutions. Select disease conditions will be discussed and technologies used to address those conditions will be examined. Students will participate in simulation lab and clinical immersion for experiential learning in hospitals, urgent care facilities, assisted living facilities, senior citizen centers, and/or other healthcare settings.

CHE 4300 (5300). Introduction to Air Pollution.

Lec. 3. Credit 3

Prerequisite: CHE 4131 (5131). Problems of air pollution and their solutions. Analysis and design of devices for the control of air pollutants from chemical processes.

CHE 4330 (5330). Polymer Engineering.

Lec. 3. Credit 3

Prerequisite: CHEM 3010. Polymerization kinetics for key commercial polymers, structure/property relationships and characterization of key polymers, processing fundamentals, fundamentals of formulation of polymer composites and blends (nanocomposites, biopolymers.)

CHE 4335. Fuel Cells.

Lec. 3. Credit 3.

Prerequisite: CHE 3010 or ME 3210 and CHEM 3510. CHEM 3510 may be taken concurrently. Emphasis will be on electrochemical techniques, fundamental principles and technologies related to proton exchange membrane fuel cells. The course will delineate theoretical energy vs. specific losses: including ohmic, mass transport, and catalytic losses. Advanced materials for specific proton exchange membrane fuel cells will be discussed and diagnostic testing methodologies will be demonstrated (polarization curves, electrochemical impedance spectroscopy, and cyclic voltammetry).

CHE 4410. Process Design I. Lec. 3. Credit 3

Prerequisite: CHE 3010, CHE 3021 and CHE 3121.

Design and synthesis of chemical systems using basic engineering principles with integration of reliability, safety and environmental aspects. The economics involved in the design of chemical plants such as capital cost, profitability, operating costs, and alternative evaluation.

CHE 4420. Process Design II.

Lec. 2. Lab. 1. Credit 3

Prerequisite: CHE 4410. Continuation of Design I but with emphasis on complex chemical systems and innovation in design. Introduction to process modeling the use of computer-aided process design and analysis.

CHE 4440. Protein Engineering. Lec. 3. Credit 3.

Students will apply principles of molecular biology and protein engineering to improve the properties of a selected protein. Computational tools and experimental methods will be applied to mutate and enhance the characteristics of proteins, which will hopefully lead to publishable results. Students will have to think about the subject creatively and use more than just knowledge from a textbook to solve the challenges encountered in the course.

CHE 4470 (5470). Interdisciplinary Studies in**Ceramic Materials Processing.** Lec. 3. Credit 3.

Prerequisite: Senior Standing in Engineering, Mathematics, Chemistry (Calculus-based), or Physics. Selected materials synthesis for metals, ceramics, and their composites; application of fracture mechanics and failure models; mechanical, chemical, and morphological characterization theory and practice; and materials design.

CHE 4510 (5510). Applied Mathematics in Chemical Engineering.

Lec. 3. Credit 3.

Prerequisite: CHE 3021, CHE 3121, MATH 2120 and Senior Standing. Applied numerical methods and the solution of differential equations in chemical engineering.

CHE 4540. Process Dynamics and Control.

Lec. 3. Credit 3

Prerequisite: CHE 4131 (5131) and CHE 4210 (5210). Analysis of the dynamic behavior of chemical processes. Basic control principles and methods of measuring and controlling process variables.

CHE 4660 (5660). Biochemical Engineering.

Lec. 3. Credit 3.

Prerequisite: CHE 4210 (5210) and Senior Standing or consent of instructor. Applications of Chemical Engineering principles to the study of biochemical systems.

CHE 4661 (5661). Transport in Biochemical and Biological Processes. Lec. 2. Lab. 2. Credit 3.
Prerequisite: CHE 4210 (5210) or consent of instructor.
Applications of chemical engineering principles to the study of biochemical and biological systems. Lab is centered around various techniques used in the biochemical and biological field.

CHE 4910. Professionalism and Ethics in Chemical Engineering. Lec. 1. Credit 1.
Prerequisite: Senior standing in Chemical Engineering.
Presentation and discussion of topics relevant to the ethics and professional behavior in the chemical engineering profession, including professional licensure. Research methodology and graduate studies preparation is also discussed.

CHE 4911. Professionalism and Ethics in Chemical Engineering—BS/MS Fast Track. Lec. 1. Credit 1
Prerequisite: Students approved for BS-MS Fast Track.
Presentation and discussion of topics relevant to the ethics and professional behavior in the chemical engineering profession, including professional licensure. Research methodology and graduate studies preparation is also discussed.

CHE 4971. Special Topics in Chemical Engineering. Credit 1.
Special topics in chemical engineering taught on an as needed basis.

CHE 4972. Special Topics in Chemical Engineering. Credit 2.
Prerequisite: Senior Standing. Special topics in chemical engineering taught on an as needed basis.

CHE 4973. Special Topics in Chemical Engineering. Credit 3.
Prerequisite: Senior Standing. Special topics in chemical engineering taught on an as needed basis.

CHE 4990. Undergraduate Research. Credit 1 to 3 per semester. Maximum 12.
Prerequisite: CHE 3990. Research and development problems, laboratory investigations, planning experimental programs, and correlating and reporting results through written works and presentations. Because of the impossibility of duplicating the conditions on a special problem, this course may not be repeated for the improvement of a grade.

Chemistry (CHEM)

Chemistry majors may not earn credit in both CHEM 1010 and 1110 or both 1020 and 1120. Credit will not be given for both CHEM 1210, 1310 and any of the above courses.

CHEM 1000. Chemistry Problem Solving. Lec. 3. Credit 3.

An introductory course for students without sufficient high school background in chemistry. Topics include metric system, atomic structure, bonding, stoichiometry, solutions and some descriptive chemistry. Not degree credit as Chemistry course. May be used for elective credit in some programs. Students may not register for this course if they have credit for any other college Chemistry course. May not be taken concurrently with any Chemistry course, excluding CHEM 1500.

◆**CHEM 1010. Introductory to Chemistry I.-Fall, Spring.** Lec. 3. Lab. 3. Credit 4.
Overview of chemical principles and applications. Laboratories emphasize general principles of chemistry.

◆**CHEM 1020. Introductory to Chemistry II.-Fall, Spring.** Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 1010. Overview of chemical principles and applications. Laboratories emphasize general principles of Chemistry.

CHEM 1050. Foundations of Chemistry Laboratory. Lab. 2. Credit 1.
Corequisite: CHEM 1000. Selected experiments to complement lecture material in CHEM 1000.

◆**CHEM 1110. General Chemistry I.-Fall, Spring.** Lec. 3. Lab. 3. Credit 4.
Basic course in general chemistry for curricula requiring more than one year of chemistry. Laboratory includes qualitative analysis procedures.

CHEM 1111. General Chemistry I Honors Recitation. Rec. 1. Credit 0.
Corequisite: CHEM 1110. An ACT score of 30 or higher is also recommended. Selected topics to add depth to the understanding of the material in CHEM 1110. Honors students can receive honors credit for CHEM 1110 by satisfactorily completing both CHEM 1110 and CHEM 1111.

◆**CHEM 1120. General Chemistry II.-Fall, Spring.** Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 1110 with a grade of C or better.
Basic course in General Chemistry for curricula requiring more than one year of Chemistry. Laboratory includes qualitative analysis procedures.

CHEM 1121. General Chemistry II Honors Recitation. Rec. 1. Credit 0.
Corequisite: CHEM 1120. A grade of A or B in CHEM 1110 is also recommended. Selected topics to add depth to the understanding of the material in CHEM 1120.

Honors students can receive honors credit for CHEM 1120 by satisfactorily completing both CHEM 1120 and CHEM 1121.

CHEM 1210. Chemistry for the Life Sciences.-Fall.

Lec. 4. Lab. 0. Credit 4.

Introduction to chemical principles and their applications to health and disease, which will include chemical structures, moles, organic chemistry and biochemistry. A knowledge of general mathematics is needed for the use of conversion factors, making of solutions, and calculation of dosages and dilutions. This course will not count as part of a chemistry sequence.

◆CHEM 1310. Concepts of Chemistry.-Fall, Spring.

Lec. 2. Lab. 2. Credit 3.

Basic principles of Chemistry including atomic structure, chemical bonding, basic stoichiometry, organic and inorganic compounds, and kinetic theory. Will not count as part of a Chemistry sequence.

CHEM 1500. First Year Interactions and Advisement.

Lec. 1. Act. 1. Credit 1.

This course engages the student in meaningful classroom and out-of-the-classroom activities. This is intended for chemistry majors and emphasizes information, activities, and requirements important to becoming an active and competent chemist.

CHEM 1971. Special Topics in General Chemistry.-Fall, Spring.

Lec. 0-1. Lab. 0-3. Credit 1.

Prerequisite: Consent of chair and instructor. Timely topics in Chemistry. Course may be taken for credit more than once.

CHEM 1972. Special Topics in General Chemistry.-Fall, Spring.

Lec. 0-2. Lab. 0-3. Credit 2.

Prerequisite: Consent of chair and instructor. Timely topics in Chemistry. Course may be taken for credit more than once.

CHEM 1973. Special Topics in General Chemistry.-Fall, Spring.

Lec. 0-3. Lab. 0-3. Credit 3.

Prerequisite: Consent of chair and instructor. Timely topics in Chemistry. Course may be taken for credit more than once.

CHEM 2010. Introduction to Inorganic Chemistry.-Fall.

Lec. 3. Credit 3.

Prerequisite: CHEM 1120. Introduction to the basic principles of inorganic chemistry including bonding, nomenclature, coordination chemistry, molecular orbital theory, and basic transition metal organometallic chemistry.

CHEM 2720. Clinical Pharmacology.-Fall.

Lec. 2. Credit 2.

Prerequisite: CHEM 3010. Principles of Pharmacology including chemical structures, actions and reactions of drugs. Does not count as technical elective in chemistry.

CHEM 2810. History of Scientific Thought.-Fall.

Lec. 3. Credit 3.

Development of the scientific theories and concepts from antiquity through the 18th century. Does not count as technical elective in chemistry.

CHEM 2820. History of Scientific Thought.-Spring.

Lec. 3. Credit 3.

Development of natural sciences in the 19th and 20th centuries. Does not count as technical elective in chemistry.

CHEM 2910. Undergraduate Research Methods.

Lec. 1. Credit 1.

Prerequisite: Permission of the instructor. CHEM 2910 is designed to introduce undergraduate students to the methods used in conducting research. This course is designed to teach students key skills utilized in a research setting, methods of data analysis, as well as how to disseminate information obtained through research. Upon completion of this course, students will be prepared to work effectively in a chemistry department research lab.

CHEM 3005. Elementary Organic Chemistry.-Fall, Spring.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: CHEM 1020 or CHEM 1120. Aliphatic and Aromatic Organic Chemistry for students in Agriculture, Human Ecology, and Pre-Medical Technology. Not for Chemistry majors.

CHEM 3010. Organic Chemistry I.-Fall, Spring.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: CHEM 1120 with a grade of C or better. Study of carbon-containing compounds using the functional group approach and an emphasis in simple mechanisms of aliphatic and aromatic compounds.

CHEM 3020. Organic Chemistry II.-Fall, Spring.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: CHEM 3010 with a grade of C or better. Study of carbon-containing compounds using the functional group approach and an emphasis in simple mechanisms of aliphatic and aromatic compounds.

CHEM 3410. Quantitative Analysis.-Fall.

Lec. 2. Lab. 6. Credit 4.

Prerequisite: CHEM 1120. Introduction to chemical analysis including titrimetric and gravimetric methods involving acid-base, oxidation-reduction, and complexometric techniques. Application of mass action, equilibria, and indicators to chemical analysis. Introduction to instrumental analysis including electrochemical and spectroscopic methods.

CHEM 3420. Analytical Applications.-Spring.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: CHEM 3410. The application of wet chemical and instrumental methods of analysis to real problems in chemistry, biochemistry and the environment.

CHEM 3500. Elements of Physical Chemistry.-Spring.

Lec. 3. Credit 3.

Prerequisite: CHEM 1120, MATH 1830 or MATH 1910. Survey of physical chemistry designed for those desiring the B.S. degree with a major in chemistry, education, pre-professional studies, biology or students in general.

CHEM 3510. Physical Chemistry.-Fall, Spring.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: CHEM 1120, MATH 1920, PHYS 2020 or PHYS 2110 (may be taken concurrently.) Introduction to quantum mechanics and spectroscopy, the gas state, thermodynamics and thermochemistry, heterogeneous equilibria, kinetics, electrochemistry, colloids, photochemistry, and the solid state.

CHEM 3520. Physical Chemistry.-Fall, Spring.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: CHEM 3510. Introduction to quantum mechanics and spectroscopy, the gas state, thermodynamics and thermochemistry, heterogeneous equilibria, kinetics, electrochemistry, colloids, photochemistry, and the solid state.

CHEM 3990. Special Problems in Chemical Education.

Lab. 1. Credit 1.

Prerequisite: CHEM 1110, CHEM 1120, six additional hours of Chemistry, and consent of a faculty research mentor and the departmental chairperson. Independent study of special topics in chemical education under the direction of a faculty mentor. Must be taken twice, preferably in consecutive semesters. Restricted to secondary education chemistry majors.

CHEM 4110 (5110). Inorganic Chemistry.-Spring.

Lec. 3. Credit 3.

Prerequisite: CHEM 2010 and CHEM 3500 or CHEM 3510. Correlation of physical and chemical properties of inorganic compounds and atomic structure.

CHEM 4150 (5150). Inorganic Chemistry Laboratory.-Spring.

Lab. 3. Credit 1.

Corequisite: CHEM 4110 (5110). Synthesis, isolation, and characterization of inorganic compounds, using conventional as well as microscale and inert gas techniques.

CHEM 4210 (5210). Chemistry of Polymers.-Fall.

Lec. 3. Credit 3.

Prerequisite: CHEM 3020 and CHEM 3500 or CHEM 3510. Preparation, structure, and physical and chemical properties of organic polymers. Experimental determination of average molar mass and its correlation to macroscopic properties. Thermal and viscoelastic behavior.

CHEM 4310 (5310). Nuclear and Radiochemistry.-Spring.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: CHEM 3500 or CHEM 3510 (may be taken concurrently.) Introduction to theory of nuclear stability and decay processes. The laboratory emphasizes the detection, safe handling, and use of radioisotopes in chemical investigations.

CHEM 4320 (5320). Spectrometric Identification of Organic Compounds.-Spring.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: CHEM 3020 and CHEM 3500 or CHEM 3510. The isolation and identification of organic compounds by both chemical and physical means with emphasis on spectroscopic methods.

CHEM 4410 (5410). Forensic Chemistry.

Lec. 3. Lab. 1. Credit 4.

Prerequisite: CHEM 1120, CHEM 3020 and CHEM 3410. This course will examine the application of chemical concepts and methods to the analysis of crime scene evidence.

CHEM 4500. Physiological Chemistry.-Spring.

Lec. 3. Credit 3.

Prerequisite: CHEM 3005. Introduction to the chemistry of biological molecules and the metabolic pathways as related to nutrition and physiological function. Not for chemistry majors.

CHEM 4520 (5520). Instrumental Analysis.-Fall.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: CHEM 3410 and CHEM 3510. Theory and practice of atomic spectroscopy, chromatography, and electroanalysis; discussion of selected instrumental techniques for analysis of surfaces, molecules, and particles.

CHEM 4610 (5610). General Biochemistry.-Fall.

Lec. 3. Credit 3.

Prerequisite: CHEM 3010 and CHEM 3020, or consent of instructor. Chemistry of proteins, lipids, carbohydrates

and nucleic acids. Includes study of pH, buffer system, and biological separation methods.

CHEM 4620 (5620). General Biochemistry.-Spring.

Lec. 3. Credit 3.

Prerequisite: CHEM 4610 (5610). Intermediary metabolism, bioenergetics, and biosynthesis.

CHEM 4650 (5650). General Biochemistry Laboratory.-Spring.

Lab. 6. Credit 2.

Prerequisite: CHEM 4610 (5610) or CHEM 4300.

Laboratory techniques associated with contemporary general Biochemistry to include buffer preparation, pKa determination, amino acid analysis, protein expression, separation and purification techniques, protein determination, enzymology, equilibrium and binding constant determinations, and carbohydrate analysis. The CHEM 5650 student will engage in additional procedures in some of the experiments.

CHEM 4710 (5710). Environmental Chemistry.-Fall.

Lec. 3. Credit 3.

Prerequisite: CHEM 3005 or CHEM 3010, and CHEM 3410 or CHEM 3500 or CHEM 3510 (courses from the latter group may be taken concurrently.) Basic concepts of environmental chemistry.

CHEM 4720 (5720). Advanced Environmental Chemistry.-Spring.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: CHEM 4710 (5710). Advanced topics within environmental chemistry including emphasis on organic, inorganic, and analytical environmental chemistry. Case studies and contemporary literature in the field will be discussed.

CHEM 4910. Chemistry Seminar.-Fall.

Lec. 2. Credit 2.

Prerequisite: One year of Chemistry. Topics to be taught include the chemical literature, employment and interviewing, computer literacy, and the organization and oral presentation of current topics in Chemistry.

CHEM 4940. Internship in Chemistry.

Credit 6.

Prerequisite: 18 hours of chemistry, Junior or Senior standing and consent of the chair. Supervised chemical work experience in a private or public agency that is related to the student's career goals. A minimum equivalent to ten weeks of half-time employment is required. Cannot be used to replace core or required elective CHEM courses within the major requirements.

CHEM 4970 (5970). Special Topics.

Lec. 1-3. Lab. 0-3. Credit 1-4.

Prerequisite: Consent of instructor. Timely topics in chemistry. Course may be taken for credit more than once.

CHEM 4980. Distinction in Chemistry Research.

Lec. 0. Credit 1.

Dissemination of independent research conducted with a Chemistry faculty advisor through participation in meetings (national meetings, state meetings and/or TTU Student Research Day), departmental seminar, and mini-thesis.

CHEM 4991. Undergraduate Research.-Fall, Spring.

Lab. 3. Credit 1.

Prerequisite: Consent of instructor and departmental chairperson. Study in chemical research; to provide experience in the methodology of experimental investigation. (Maximum credit toward degree is four hours.) May not be repeated to improve grade.

CHEM 4992. Undergraduate Research.-Fall, Spring.

Lab. 6. Credit 2.

Prerequisite: Consent of instructor and departmental chairperson. Study in chemical research; to provide experience in the methodology of experimental investigation. (Maximum credit toward degree is four hours.) May not be repeated to improve grade.

CHEM 4993. Undergraduate Research.-Fall, Spring.

Lab. 9. Credit 3.

Prerequisite: Consent of instructor and departmental chairperson. Study in chemical research; to provide experience in the methodology of experimental investigation. (Maximum credit toward degree is four hours.) May not be repeated to improve grade.

◆ Meets Tennessee Technological University general education requirements (Natural Sciences).

Child and Family Studies (CFS)

CFS 1000. Introduction to the Profession.

Lec. 1. Credit 1.

Prerequisite: Human Ecology and Child and Family Studies major and minor or consent of instructor. Introduction to college: the HEC/CFS majors and student opportunities. Review of the history, philosophy, trends, and professional publications and associations in HEC/CFS. Exploration of career opportunities.

CFS 1210. Field Experiences: Child and Family Studies.

Lab. 4. Credit 1.

Students participate in professional related activities via: diverse agency and educational settings through guided observations, interviews, and "hands-on" experiences; planned special activities; attendance at career-related events; and events of students' own choosing.

CFS 1300. Introduction to the Family.

Lec. 1. Credit 1.

Corequisite: CFS 1310. Fundamental concepts and trends related to current challenges of families, marriage, parenthood, and work.

CFS 1310. Field Experiences: Family and Community.

Lab. 4. Credit 1.

Corequisite: CFS 1300. Field experience in community agencies and organizations and family settings and their interrelationships.

CFS 2210. Field Experience: Observation of Young Children.

Lab. 8. Credit 1.

Learn and practice observational techniques, approaches and instruments appropriate for young children in various settings.

CFS (ECSP) 2400. Children with Special Needs.

Lec. 3. Credit 3.

Knowledge of risk factors, developmental delay, and categories of disability. Understanding of special education and its emphasis on prevention, early intervention, and services in normal environments. Practicum embedded into course.

CFS (ECSP) 2410. Practicum: Young Children with Special Needs.

Lab. 4. Credit 1.

Supervised participation in service delivery settings.

CFS 3600. Family, Community & Professional Partnerships.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Study of the development of alliances among families, childrens' and families' advocates, and professionals. The development of collaboration and communication skills, including conferencing and interviewing skills. (Same as HEC 352: Parent Education, prior to Fall 1998.)

CFS 4000. Seminar: Professional Development Issues.

Lec. 2. Credit 2.

Study of professional and multicultural issues. Examination of relevant professional topics, including legal and behavior/group management issues. Continued development of communication skills, including problem-solving, and conflict resolution.

CFS (ECSP) 4890. Seminar: Student Teaching/Internship.

Lec. 3. Credit 3.

Examination of important professional topics, including a personal and professional profile, a portfolio, a resume, professional behavior, and professional organizations. Analysis of personal and professional resources.

CFS 4900. Community Field Experience.

Lab. 4. Credit 1.

Prerequisite: Senior Standing. Preparation for internship. Involvement with community agencies and programs serving children and families.

Civil and Environmental Engineering (CEE)

CEE 1020. Connections to Civil and Environmental Engineering.

Rec. 2. Credit 1.

Prerequisite: Freshman Standing. Engages the student in meaningful academic and non-academic activities introducing students to the CEE department and the civil engineering profession. Emphasizes time management and study skills, department and university resources, faculty interaction, professional and student organizations, and the civil engineering profession.

CEE 2110. Statics.

Lec. 3. Credit 3.

Prerequisite: PHYS 2110 (PHYS 2110 may be taken concurrently); C or better in MATH 1920. Vector algebra, resultants, equilibrium, friction, centroids, moment of inertia, trusses, machines and frames, beam shear and moments.

(ENGR 2110, TTP Course)
CEE 3000. Civil Engineering Graphics.

Lab. 4. Credit 2.

Prerequisite: Junior Standing. The course introduces students to the use of computer aided design and drafting software (CADD) and to instruct students in best practices for preparing Civil Engineering drawings.

CEE 3020. Surveying.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MATH 2110. Introduction to the fundamental principles, instruments, and techniques associated with surveying for highway purposes.

CEE 3030. Civil Engineering Materials.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: CEE 3110. Characteristics and uses of aggregates, Portland cement, concrete and bituminous materials for highways and other major engineering works.

CEE 3040. Geotechnical Engineering Lab.

Lab. 2. Credit 1.

Prerequisite: CEE 3030. Measurement of basic engineering properties of soils.

CEE 3100. Computers in Civil Engineering.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ENGR 1120 and MATH 2110. Computer applications to solve civil engineering problems, algorithmic structuring, numerical methods, and error analysis.

CEE 3110. Mechanics of Materials.

Lec. 3. Credit 3.

Prerequisite: C or better in CEE 2110. Stress, strain, Hooke's law, extension, torsion, and bending; beam deflections, column buckling, and combined stresses.

CEE 3120. Mechanics of Materials Laboratory.

Lab. 2. Credit 1.

Prerequisite: CEE 3110. A series of experiments which demonstrate the theory of mechanics of materials and the most important characteristics of engineering materials.

CEE 3320. Structural Mechanics.

Lec. 2. Rec. 2. Credit 3.

Prerequisite: CEE 3110. Analysis of statically determinate and indeterminate structures; influence lines; and moving loads. Classical and computer methods.

CEE 3413. Environmental Engineering.

Lec. 3. Credit 3.

Prerequisite: CHEM 1110 and MATH 2110. Fundamentals of environmental engineering with applications in water quality, water and wastewater treatment, solid waste management, air pollution, and hazardous waste management.

CEE 3420. Hydraulics.

Lec. 3. Credit 3.

Prerequisite: ME 3720. Fundamental principles and design of water and wastewater supply, stormwater and sanitary sewer systems and their components, including pipes, pumps, storage facilities, detention basins, open-channels, and culverts.

CEE 3430. Environmental Engineering Lab.

Lab. 2. Credit 1.

Prerequisite or corequisite: CEE 3413. Laboratory experiments to illustrate the application of engineering fundamentals to environmental systems.

CEE 3610. Transportation Engineering.

Lec. 3. Credit 3.

Prerequisite: CEE 3020. Introduction to transportation engineering; planning, location, design, and operation of transportation facilities.

CEE 3710. Principles of Engineering Economy.

Lec. 2. Credit 2.

Prerequisite: MATH 1920. Concepts and techniques useful in the economic evaluation of engineering alternatives.

CEE 3720. Engineering Statistics.

Lec. 2. Credit 2.

Prerequisite: MATH 1920 and Junior Standing.

Engineering applications of probability, hypothesis testing, and confidence intervals.

CEE 4130 (5130). Matrix and Finite Element Methods.

Lec. 3. Credit 3.

Prerequisite: CEE 3320 or ME 4640 (5640) and MATH 2010 or MATH 4510 (5510). Matrix formulations using flexibility and stiffness methods for structural analysis of skeletal structures. Finite element formulations and applications.

CEE (ME) 4160 (5160). Experimental Stress Analysis.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: CEE 3110 and MATH 2120. Introduction to theory of elasticity; photoelasticity; theory and application of strain gauges and rosettes; brittle coatings; holographic interferometry; and moiré analysis.

CEE (ME) 4190 (5190). Advanced Mechanics of Materials.

Lec. 3. Credit 3.

Prerequisite: CEE 3110, MATH 2120 or consent of instructor. Advanced topics, fracture mechanics, elastic support, non-circular shafts, curved beams, thick-walled cylinders, introduction to plates, and thin shells of revolution.

CEE 4310. Structural Steel Design.

Lec. 2. Rec. 2. Credit 3.

Prerequisite: CEE 3320. Design of members and structures in steel. Analysis and design of beams, tension members, compression members, members with combined stresses, and standard connections.

CEE 4320. Reinforced Concrete Design.

Lec. 2. Rec. 2. Credit 3.

Prerequisite: CEE 3320. Design of members and structures in concrete. Design of beams, slabs, columns, and footings.

CEE 4350 (5350). Advanced Structural Design.

Lec. 3. Credit 3.

Prerequisite: CEE 4310. Special topics in analysis and design of steel structures. Plastic design, composite design, plate girders, and special connections.

CEE 4360 (5360). Advanced Topics in Structural Concrete Design.

Lec. 3. Credit 3.

Prerequisite: CEE 4320. Special topics in the design of concrete structures. Combined footings, retaining walls, two-way slabs, and prestressed concrete.

CEE 4380 (5380). Bridge Design.

Lec. 3. Credit 3.

Prerequisite: CEE 4310. Design of structural steel and reinforced concrete bridges.

CEE 4410 (5410). Solid and Hazardous Waste Management.

Lec. 3. Credit 3.

Prerequisite: CEE 3413 or consent of instructor. The collection and disposal of solid wastes. Treatment and disposal technologies of hazardous wastes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4420 (5420). Engineering Hydrology.

Lec. 3. Credit 3.

Prerequisite: CEE 3420 or consent of instructor. Fundamental processes in the hydrologic cycle including precipitation, infiltration, and runoff. Quantitative approaches for engineering hydrology to estimate flows for a variety of design problems.

CEE 4430 (5430). Water and Wastewater Engineering.

Lec. 3. Credit 3.

Prerequisite: CHEM 1120 and CEE 3413 or consent of instructor. Analytical methods for use in water quality management of streams, lakes, reservoirs, and groundwater systems. Project design of water and wastewater treatment plants. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4440 (5440). Water Resources Engineering.

Lec. 3. Credit 3.

Prerequisite: CEE 3420 or consent of instructor. Problems related to the planning and design of systems to manage water resources for flood-damage reduction, hydropower, and river navigation.

CEE 4450 (5450). Water Quality Modeling.

Lec. 3. Credit 3.

Prerequisite: CHEM 1120 and CEE 3413 or consent of instructor. Mathematical modeling of chemical and biological processes occurring in streams, lakes, and estuaries, emphasizing oxygen demand and nutrient processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4500 (5500). Construction Engineering Management.

Lec. 3. Credit 3.

Prerequisite: Within two semesters of graduation. The design and management of the construction phase of a project: scheduling, estimating, contracts, laws, financing, and safety.

CEE (ENGR) 4510. Engineering Management.

Lec. 3. Credit 3.

Prerequisite: Senior Standing in an Engineering discipline. Management theory applied to engineering and technical organizations. Topics include management functions in an engineering context; engineering techniques and tools for management; project

management; management/leadership of technical people and teams; and contemporary engineering management topics, e.g., rapid technological change and globalization.

CEE 4600 (5600). Civil Engineering Materials II.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: CEE 3030. Design and testing of high-strength PCC, self-consolidating PCC, high volume fly ash PCC and pervious PCC. Controlled low-strength materials. Concrete formwork design. Masonry materials evaluation. Aggregate production and improvement.

CEE 4610 (5610). Pavement Design.

Lec. 3. Credit 3.

Prerequisite: CEE 3610. Structural design of flexible and rigid pavements. Pavement rehabilitation. Properties of subgrades, base courses, and paving materials.

CEE 4630 (5630). Traffic Engineering.

Lec. 3. Credit 3.

Prerequisite: CEE 3610. Techniques of traffic engineering measurements, investigations, and data analysis; design, application, and operation of traffic control systems and devices.

CEE 4640 (5640). Highway Engineering.

Lec. 3. Credit 3.

Prerequisite: CEE 3610. Theory and practice of highway geometric design, highway plans, construction practices, and computer applications to highway design.

CEE 4660 (5660). Transportation Planning.

Lec. 3. Credit 3.

Prerequisite: CEE 3610. System planning and evaluation. Characteristics, impacts, and costs. User patterns. Alternative analysis.

CEE 4700 (5700). Masonry Design.

Lec. 2. Rec. 2. Credit 3.

Prerequisite: CEE 3030 and CEE 4320 or consent of instructor. Masonry materials and construction. Design of masonry beams, walls, and columns. Seismic design of masonry structures.

CEE 4800. Geotechnical Engineering.

Lec. 3. Credit 3.

Prerequisite: CEE 3030 and GEOL 3210. (CEE 3030 and GEOL 3210 may be taken concurrently.) Soil physical properties, classification, permeability and seepage, consolidation, design, and analysis of foundations.

CEE 4810 (5810) Foundation Engineering.

Lec. 3. Credit 3.

Prerequisite: CEE 4800. Soil mechanics (emphasis on stress and shear strength), bearing capacity, magnitude

and time-rate of consolidation, geotechnical design of shallow and deep foundations, lateral earth pressure, and geotechnical aspects of retaining wall design.

CEE 4850 (5850). Forensic Engineering.

Lec. 3. Credit 3

Prerequisite: CEE 4800 (CEE 4800 may be taken concurrently) and CEE 4310 or CEE 4320. Forensic case studies related to civil engineering.

CEE 4920. Professionalism and Ethics.

Lec. 1. Credit 1.

Prerequisite: Senior Standing. A discussion of the ethical, social, and economic considerations in engineering practice, and professional and technical societies.

CEE (ME) 4930 (5930). Noise Control.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MATH 2120 and PHYS 2110. Identification and description of noise sources and noise radiation, methods of noise measurements and criteria for noise levels, principles, and techniques of noise control.

CEE 4940. Fundamentals of Civil Engineering.

Rec. 2. Credit 0.

Prerequisite: Graduating Senior. Review fundamentals in preparation for fundamentals-of-engineering (FE) test.

CEE 4950. Senior Design Project. Lab. 6. Credit 3.

Prerequisite: Consent of instructor. Comprehensive design project of civil engineering projects using a team approach.

CEE 4990 (5990). Special Problems.

Credit 1-4 per semester. Maximum 18.

Prerequisite: Approval of departmental chairperson. Current topics in the student's area of interest. May not be repeated to improve a grade.

College of Arts and Sciences (CAS)

CAS 4910. Internship in Technology and Community Development I. Lab. 2. Credit 1.

Prerequisite: Junior Standing or above. From media tutorials (CD-ROM, videotape, etc.), personal tutorials, and workshops, the student learns at least three state-of-the-art applications of current computer technologies to community development projects. Student must sign a written intention to complete CAS 4910, CAS 4920, and CAS 4930. A-F grading.

CAS 4920. Internship in Technology and Community Development II. Lab. 4. Credit 2.

Prerequisite: CAS 4910 or consent of the supervisor. The student collaborates with others in a workshop setting to practice at least three state-of-the-art

applications of current computer technologies to community development projects. A-F grading.

CAS 4930. Internship in Technology and Community Development III. Lab. 4-6. Credit 2-3.

Prerequisite: CAS 4910 and CAS 4920 or consent of the supervisor. The student completes a community development project, or a substantial, definable part of a project, based on at least three state-of-the-art applications of current computer technologies. A-F grading.

MSCI 1020. First-Year Connections.

Rec. 2. Credit 1.

This course is intended as a bridge course for those students entering TTU from high school and majoring in mathematics and the various science disciplines within the College of Arts and Sciences. The course is designed to strengthen the student's connection to TTU, enhance skills needed for academic success, and foster appreciation for the multidisciplinary nature of addressing real-world problems. This course emphasizes critical thinking in both academic and non-academic contexts by including significant elements of group work in problem-based learning activities.

Communication (COMM)

(O) and (E) Denote Odd and Even Years Respectively

COMM 1020. Foundations of Communication.

Lec. 3. Credit 3.

Role of communication in society and education. Overview of topics germane to understanding effective communication.

◆COMM 2025. Fundamentals of Communication.

Lec. 3. Credit 3.

Introduction to the communication process, interpersonal communication, group discussion, and public speaking. Students are required to prepare and deliver speeches. **(SPCH 1010, TTP Course)**

COMM 2075. Organizational Communication.

Lec. 3. Credit 3.

This course introduces students to the theories and practices of communication within the work place. It covers various communication settings including interviewing, presentations, group work, meetings, and email.

COMM 2090. Interpersonal Communication.

Lec. 3 Credit 3.

Prerequisite: COMM 2025. This course examines basic verbal and nonverbal elements affecting communication between individuals in family, peer group, and work contexts. Students are presented with the principles,

concepts, attitudes, skills, and techniques necessary for successful interaction in one-to-one settings. The main emphasis is placed on effective management of personal and professional relationships.

COMM 2800. Interviewing. Lec. 3. Credit 3.

This course introduces students to the interpersonal communication aspects of the interviewing process. Students will learn the various types of interviews and their purpose. Students will plan and prepare interviews from the roles of the interviewee and interviewer.

COMM 3000. Computer Mediated Communication.

Lec. 3. Credit 3.

An examination of human communication achieved through computer technology. Analysis of how the use of electronic devices such as email, instant messaging, cell phones, internet, blogs, video games, etc. affects interpersonal and group communication.

COMM 3100. Communication Theory.

Lec. 3. Credit 3.

Prerequisites: COMM 2025, COMM 2090, JOUR 2200, Junior Status or consent of instructor. Examination and application of the major theories of Communication processes, including mass communication, intrapersonal, interpersonal, intercultural, rhetorical, organizational, and other approaches to the study of

COMM 3120. Visual Communication/Rhetoric.

Lec. 3. Credit 3.

Prerequisite: Upper-division status or by permission of the instructor. The course introduces basic principles of critical perception and interpretation of the processes of visual communication/rhetoric in the mass media, fine arts, films, and photography.

COMM 3130. Speech Activities. Lec. 3. Credit 3.

Prerequisite: Consent of instructor. For students interested in all forms of public speaking and contest work.

COMM 3200. Research Methods in Communication.

Lec. 3. Credit 3.

Prerequisite: COMM 2025, COMM 2090, JOUR 2200, COMM 3100 or consent of instructor. An introduction to the diverse methods of research employed in the study of Communication and how they connect to major theories in Communication. This course focuses on quantitative and qualitative methods of research in Communication, including content analysis, survey research, discourse analysis, rhetorical analyses, observational research, and interviewing.

COMM 3400. Nonverbal Communication.

Lec. 3. Credit 3.

Prerequisite or Corequisite: COMM 2025. This course will examine the theory, research, and application of nonverbal communication as it is used in personal and professional contexts. The usage, effects, and application of nonverbal communication in interpersonal relationships, the workplace, the classroom, the courtroom, and intercultural relationships will be examined.

COMM 3620. Intercultural Communication.

Lec. 3. Credit 3.

Theoretical and practical ideas to prepare students for cross-cultural interactions. Emphasis on interpersonal, face-to-face intercultural communication in various domestic and international settings.

COMM 3630. Discussion and Parliamentary Procedure.

Lec. 3. Credit 3.

Conduct of a meeting: panels, symposiums, and forums. Organization, planning, and participation in group discussion and conference.

COMM (SPED) 4000 (5000). Introduction to Communication Disorders.-Spring (O).

Lec. 3. Credit 3.

Principles of and therapeutic approaches to speech, language, and hearing disorders.

COMM (SPED) 4150 (5150). Speech and Language Acquisition and Development.-Spring (E).

Lec. 3. Credit 3.

Normal speech/language development, anatomy of speech structures, distinctive features and implications of process and analysis systems.

COMM 4420. Advanced Organizational Communication.

Lec. 3. Credit 3.

Prerequisite: Upper-division status in communication or by permission of the instructor. Approaches to the understanding of communicative cultures in modern organizations and their operant principles.

COMM 4430 (5430). Advanced Interpersonal Communication.

Lec. 3. Credit 3.

Prerequisite: COMM 2090 or consent of instructor. Communications theory applied to informal and face-to-face situations.

COMM 4440. Semiotics.

Lec. 3. Credit 3.

Studies in the philosophy and principles of code systems and language theory, including a range of code systems from simple to complex.

COMM 4540. Historic American Public Address.

Lec. 3. Credit 3.

This course is a critical survey of historic American public discourse from the founding of the nation to the end of WWII. Students will analyze historically significant speeches, their rhetorical design, and their influence on public opinion and policy.

COMM 4550. Contemporary American Public Address.

Lec. 3. Credit 3.

This course covers public oratory from WWII to the present. Students will read some major speeches that marked important social and political events and will examine the speeches' influence on public belief and action.

COMM 4601, 4602, 4603. Special Topics in Speech Communication.

Lec. 3. Credit 1, 2, 3.

Prerequisite: Upper-division status; may be repeated to a maximum nine hours. Presentation of directed, individual research in selected topics in speech communication beyond regular course offerings. Topic will be specified at time of offering.

COMM 4620 (5620). Advanced Public Speaking.-Fall (E).

Lec. 3. Credit 3.

Prerequisite: COMM 2025. Advanced oral communications as practiced from the platform, with emphasis on special types of speaking.

COMM 4630 (5630). Persuasion.

Lec. 3. Credit 3.

Prerequisite: COMM 2025 or consent of instructor. Promotes intellectual understanding and critical application of how individuals and groups influence the attitudes, beliefs, and behaviors of others.

COMM 4850. Internship.

Credit 3.

Prerequisite: COMM 2025. A supervised experience in a professional or career setting including: Communication Pedagogy, Debate, Interpersonal, Organizational, Public Relations, and Public Speaking. Students may not take more than 6 hours total of the Internship toward degree requirements.

COMM 4851. Internship.

Credit 6.

Prerequisite: COMM 2025. A supervised experience in a professional or career setting including: Communication Pedagogy, Debate, Interpersonal, Organizational, Public Relations, and Public Speaking. Students may not take more than 6 hours total of the Internship toward degree requirements.

COMM 4900. Independent Study in Communication.

Credit 3.

Prerequisite: COMM 2025. Directed readings and research for students desiring to work on topics of

individual interest beyond the course offerings. Students may not take more than 6 hours total of the Independent Study toward degree requirements.

COMM 4901. Independent Study in Communication.

Credit 6.

Prerequisite: COMM 2025. Directed readings and research for students desiring to work on topics of individual interest beyond the course offerings. Students may not take more than 6 hours total of the Independent Study toward degree requirements

◆ **Meets Tennessee Technological University general education (Communication/Oral Presentation) requirements.**

Computer Science (CSC)**CSC 1200. Principles of Computing.**

Lec. 3. Credit 3.

Prerequisite: ACT Math score of 25 or higher, MATH 1710, MATH 1720, MATH 1730, or MATH 1910. This course introduces the field of computer science. Topics include computing as a creative activity, abstraction, data and information, algorithms, programming, the Internet, and global impacts of computing. Prerequisite course may be taken concurrently.

CSC 1300. Introduction to Problem Solving and Computer Programming.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: CSC 1200 or MATH 1910. MATH 1910 may be taken concurrently. Digital computers; problem solving and algorithm development; programming is introduced using a procedural approach, but classes and object-orientation are introduced; design and testing are emphasized. Students complete a series of weekly laboratory exercises for developing proficiency in problem solving and computer programming.

CSC 1310. Data Structures and Algorithms.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: C or better in CSC 1300; or C or better in CSC 2100 and CSC 2101. Abstract data types and fundamental data structures including stacks, queues, and trees; algorithms to search, sort, and manipulate data using such structures; and introduction to runtime analysis. Students complete a series of weekly laboratory exercises for developing proficiency in implementing and utilizing data structures.

CSC 2310. Object-Oriented Programming and Design.

Lec. 3. Lab 2. Credit 4.

Prerequisite: C or better in CSC 1310; or C or better in CSC 2110 and CSC 2111. Theory and practice of object-oriented programming and design. Encapsulation, inheritance, dynamic binding, and polymorphism; and

introduction to UML and design patterns. Students complete a series of weekly laboratory exercises for developing proficiency in object-oriented programming and design.

CSC 2400. Design of Algorithms. Lec. 3. Credit 3.
Prerequisite: MATH 1920; and C or better CSC 1310 or both CSC 2110, CSC 2111;. Advanced data structures and applications, problem solving strategies, heuristics, and complexity of algorithms. MATH 1920 may be taken concurrently.

CSC 2500. Unix Laboratory. Lab. 2. Credit 1.
Prerequisite: C or better in CSC 1310 or both CSC 2110 and CSC 2111. Introduction to UNIX operating systems, the facilities, tools, and development procedures in an environment designed for systems programming. Prerequisites may be taken concurrently.

CSC 2560. Networks for Information Technologists. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2500. Course covers theoretical and practical aspects of computer networks from an information technology perspective. CSC 2500 may be taken concurrently.

CSC 2700. Discrete Structures for Computer Science. Lec. 3. Credit 3.
Prerequisite: MATH 1910. Applications of discrete mathematics to computer science, sets and boolean algebra, relations, and graphs, with applications to computer logic and data structures.

CSC 2710. Foundations of Computer Science. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 1610 or CSC 2700; and C or better in CSC 1310 or both CSC 2110 and CSC 2111. Application of discrete structures to model computational processes; techniques for analysis of algorithms; and automata and concepts of language theory. CSC 1310 or both CSC 2110 and 2111 may be taken concurrently.

CSC 2901, 2903, 2903. Special Topics. Credit 1, 2, 3.
Prerequisite: Consent of instructor. Timely topics in Computer Science. Individual courses may not be repeated either for credit or for improvement of credit.

CSC 3020. Numerical Methods. Lec. 3. Credit 3.
Prerequisite: MATH 1920, and C or better in CSC 1310 or CSC 2100 or ENGR 1120. Linear and non-linear equations; convergence and error analysis; quadrature; interpolation; numerical differentiation and integration; first order differential equations; boundary value problems; and approximation of functions.

CSC 3030. Practical and Professional Issues in Computer Science. Lec. 1. Lab. 1. Credit 1.
Prerequisite: Junior standing, COMM 2025 or PC 2500, and C or better CSC 1310 or both CSC 2110 and CSC 2111. Social, ethical, and career aspects of computing. Course includes written, oral, and audio-visual communication in computer science.

CSC 3040. Professionalism, Communication and Research in Computing. Lec. 3. Credit 3.
Prerequisite: Junior Standing, COMM 2025 or PC 2500, and C or better in CSC 1310 or both CSC 2110 and CSC 2111. Social, ethical, and career aspects of computing. Written, oral, and audio-visual communication in computer science; presentation techniques, report preparation, and technical correspondence. Introduction to research in computing.

CSC 3100. Web Programming. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 1310 or both CSC 2110 and CSC 2111. Development of web applications with client and server-side technologies.

CSC 3220. Fundamentals of Data Science. Lec. 3. Credit 3.
Prerequisites: MATH 2010, MATH 3070 or MATH 3470, or MATH 4470 (5470), CSC 3300, and C or better in CSC 1310 or both of CSC 2110 and CSC 2111. Introduction to the tools and techniques for developing data science applications and to the basics of Data Science including programming for data management, data manipulation, data analytics, and data visualization. Students will be introduced to various machine learning algorithms, and learn to formulate context-relevant questions and hypothesis to drive scientific research and understand statistical inference. Students will be introduced to Python and R, and will be expected to create tools using these programming languages. The foundation is laid for big data applications ranging from fraud detection to healthcare informatics.

CSC 3230. Healthcare Data Analytics. Lec. 3. Credit 3.
Prerequisites: MATH 3070 or MATH 3470, and C or better in CSC 2400. Introduction to the tools and techniques for developing data science applications. The foundation is laid for big data applications ranging from fraud detection to healthcare informatics.

CSC 3300. Database Management Systems. Lec. 3. Credit 3.
Prerequisite: Junior Standing; and C or better in CSC 1310 or both CSC 2110, and CSC 2111. Organization and management of large data files; data definition; database models; query languages; crash recovery; concurrency control; and case studies.

CSC 3340. Deterministic Computer Models.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 1310 or both CSC 2110, CSC 2111; and MATH 2010. Formulation and application of the models of linear, non-linear, integer, and dynamic programming including computer solutions of the algorithms.

CSC 3350. Probabilistic Computer Models.

Lec. 3 Credit 3.

Prerequisite: MATH 3470. Stochastic models of queuing, game, inventory, and decision theory with computer solutions in algorithmic form and by digital simulation.

CSC 3410. Computer Organization and Assembly Language Programming.

Lec. 3. Credit 3.

Prerequisite: C or better in 1310 or both CSC 2110 and CSC 2111. Computer organization and architecture; machine language; and assembly language programming techniques.

CSC 3560. Information Storage and Management.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2500 and CSC 2560. Course covers storage technologies, storage system architectures, storage networking technologies, business continuity and information availability principles and best practices, storage management and security principles and best practices.

CSC 4010 (5010). Programming Languages.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2710 and CSC 3410. Concepts distinguishing modern programming languages with emphasis on language design, implementation, and run-time behavior.

CSC 4020 (5020). Compiler Construction.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2710 and CSC 3410. Programming language translator design with emphasis on design concepts, parsing, code generation, tools, and code improvement; and construction of a small compiler.

CSC 4040. Undergraduate Computing Research Experience.

Credit 3.

Prerequisite: C or better in CSC 3040 and consent of instructor. This course combines instruction on how to perform computing research with a faculty-mentored research project.

CSC 4100 (5100). Operating Systems.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 1310 or both CSC 2110, CSC 2111 and either C or better in CSC 3410 or ECE 3130. A historical perspective of operating systems; overview of modern systems; processor, storage, and

process management; virtual memory; deadlocks; concurrent processing and programming; protection; and case studies.

CSC 4200 (5200). Computer Networks.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2400. Data communications and computer networks; network models and protocols; local area networks; and data security.

CSC 4220. Data Mining and Machine Learning.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2400 and CSC 3220. Introduction to a solid grounding in machine learning concepts as well as practical advice on applying machine learning tools and techniques in real-world data mining situations, including preparing inputs, interpreting outputs, evaluating results, and the algorithmic methods at the heart of successful data mining. Students will also be introduced to the latest advances in the field, including data transformations, ensemble learning, massive data sets, multi-instance learning, with an application towards the leading edge of contemporary research.

CSC 4240 (5240). Artificial Intelligence.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2400. A unified survey of AI methods and applications; search and problem solving; knowledge representation; methods of reasoning, planning and uncertainty; learning, perception and communication; and rational agents.

CSC 4320 (5320). Computer Architecture.

Lec. 3. Credit 3.

Prerequisite: CSC 3410 or equivalent. Computer Systems, the CPU, the control unit, microprogramming, parallel organization, and RISC architectures.

CSC 4400 (5400). Analysis of Algorithms.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2400. Analysis techniques; search, traversal, string, and graph algorithms; and NP-hard and NP-complete problems.

CSC 4450 (5450). Introduction to Automata Theory and Computation.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2710, CSC 2400 recommended. Finite automata; regular sets; context-free languages, pushdown automata; Turing machines; recursive languages; computability; and computational complexity.

CSC 4570. IT Security.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2500 and in either CSC 2560 or 4200. This course covers the fundamentals of

computer security needed for IT professionals. It is an overview of various technical and administrative aspects of Information Security. It introduces students to assets in typical IT infrastructure, potential threats to assets, common associated vulnerabilities, protection of assets, and response to security incidents.

CSC 4575 (5575). Information Assurance and Cryptography.

Lec. 3. Credit 3.

Prerequisite: Junior Standing and C or better in CSC 1310 or both CSC 2110 and CSC 2111. Course introduces students to the fundamentals of information assurance and cryptographic techniques along with their application to the prevention, detection, and mitigation of cyber threats.

CSC 4580. Software Reverse Engineering.

Lec. 3. Credit 3.

Prerequisite: CSC 2400. Basic concepts of reverse engineering and general techniques used for reverse engineering. Reverse engineering applied to basic static and dynamic analysis of malware executables. Study of malware behavior, techniques that malware uses to thwart detection and analysis, and hands-on exercises using malware analysis tools and best practices.

CSC 4610. Software Engineering I.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: CSC 2120 or CSC 2310, CSC 2400, CSC 3030 or 3040, and CSC 3300, and Senior Standing. Course covers process models, agile methods, requirement analysis, design, testing, usability, configuration management and project management.

CSC 4620. Software Engineering II.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: C or better in CSC 4610. Course covers advanced agile methods, coding, advanced testing concepts, deployment and maintenance.

CSC 4710 (5710). Design and Development of Human and Web Interfaces.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 1310 or both CSC 2110, CSC 2111, and C or better in either CSC 3030 or CSC 3040. A course in human-computer interaction, design and use interface development. It will expose students to tools, techniques, and ideas for designing effective human computer interfaces and discuss practical and legal aspects of accessibility.

CSC 4750 (5750). Computer Graphics.

Lec. 3. Credit 3.

Prerequisite: MATH 2010 and C or better in CSC 2400. Interactive graphical techniques including three-dimensional transformations, hidden surface removal, texture mapping, and shading.

CSC 4760. Parallel Programming.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 2400 and CSC 2500. Foundations of parallel computing including the parallel computer architectures, principles of parallel algorithm design, OpenMP and MPI programming models for shared- and distributed-memory systems, along with numerical and non-numerical algorithms for parallel systems.

CSC 4770. Distributed and Cloud Computing.

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 4760. This course will cover the concepts in distributed systems including distributed computing, networking, operating systems, cloud, and programming languages. Furthermore, it will examine current applied topics in distributed systems.

CSC 4801, 4802, 4803 (5801, 5802, 5803). Directed Readings in Computer Science.

Credit 1, 2, 3.

Prerequisite: Consent of instructor. This course provides for individual study under the direction of a faculty member in developing areas of Computer Science.

CSC 4901, 4902, 4903 (5901, 5902, 5903). Special Topics.

Credit 1, 2, 3.

Prerequisite: Consent of instructor. Timely topics in Computer Science. May be repeated for credit if the topic is different.

CSC 4990. Computer Science Internship.

Credit 3 or 6.

Prerequisite: Department approval, C or better in CSC 3030, CSC 3550, and CSC 3300. Part-time employment in a professional or institutional situation related to the student's area of concentration in Computer Science. This course may be taken as two 3-hour courses or one 6-hour course. The 6-hour option will be approved in only very limited circumstances.

Creative Inquiry (CISE)

CISE 4000. Creative Inquiry Summer Experience.

Credit 0.

Banner course registration for students who have been awarded a Creative Inquiry Summer Experience (CISE) grant.

Criminal Justice (CJ)

(O) and (E) Denote Odd and Even Years Respectively

CJ (SOC) 2660. Criminology.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing. Crime, the criminal and society's responses to the behavior.

CJ 2700. Introduction to Law Enforcement.

Lec. 3. Credit 3.

Introduction to contemporary police organization and operations.

(CRMJ 1010, TTP Course)

CJ 2850. Criminal Law and Procedure.

Lec. 3. Credit 3.

Substantive criminal law and the rights of defendants to criminal charges.

(CRMJ 1020, TTP Course)

CJ 3000. Rules of Evidence.

Lec. 3. Credit 3.

Prerequisite: CJ 2850. Rules and exceptions governing the admission and exclusion of evidence including such issues as relevancy, presumptions, and burden of proof.

CJ (WFS) 3500. Wildlife Law Enforcement.

Lec. 3. Credit 3.

State wildlife laws and practices used in their enforcement. Enrollment primarily restricted to WFS majors.

CJ 3610. Advanced Criminal Procedure.

Lec. 3. Credit 3.

Prerequisite: Junior Standing and SOC 1010 or CJ 2660 or SOC 2660. Administration of the criminal process with particular attention to recent U.S. Supreme Court decisions regarding the Fourth, Fifth, and Sixth Amendments.

CJ (SOC) 3620. Victimology.

Lec. Credit 3.

Prerequisite: SOC 1010 or CJ 2660. Students must be majoring in SOC, SOC/CJ, or SOC/SW. Non-majors may be admitted by consent of instructor. This course provides an in-depth analysis of the victims of criminal activity including various challenges victims face as they seek justice through the criminal justice system; risk factors and probability of experiencing crime; and, specific theoretical perspectives that center on the victims of crime. Topics such as restorative justice and victim blaming are also explored.

CJ (SOC) 3640. Cybercrime.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or consent of the instructor. This course provides a broad introduction into the world of cybercrime. Cybercrime includes various forms of criminal activity and is broadly defined as the destruction, theft, or unauthorized or illegal use, modification, or copying of information, programs, services, equipment, or communication networks.

CJ (SOC) 3650. Juvenile Delinquency.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010. Causes of juvenile misconduct, possible responses to the problem, and the system of juvenile justice.

CJ (SOC) 3911. Introduction to Crime Analysis.

Lec. 3. Credit 3.

Prerequisite SOC 1010 and SOC (CJ) 2660. Students must be majoring in SOC, SOC/CJ, or SOC/SW. Non majors may be admitted by consent of instructor. This course provides students with instruction in the use of Microsoft Excel with applications for crime analysis.

CJ (SOC) 4010 (5010). Organized Crime.

Lec. 3. Credit 3.

Prerequisite: Sophomore standing and SOC 1010 or CJ 2660 or SOC 2660. Organized crime in America as a product of legal, historical, cultural, and economic forces.

CJ (ANTH, SOC) 4040 (5040). Law and Culture.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A comparative cross-cultural analysis of primitive, traditional, and modern attitudes toward law, social control, punishment, and individual responsibility.

CJ (SOC) 4050. Crime and Media.

Lec. 3 Credit 3.

Prerequisite SOC 1010 or SOC/CJ 2660 or consent of the instructor. An analysis of crimes, criminals, and punishment as they appear in American popular culture and various media.

CJ (SW) 4100 (5100). Probation and Parole.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Probation and parole services with special attention to current practices and issues.

CJ (SW) 4120 (5120). Case Management.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Individual and group methods used in counseling and treating offenders in both the institutional and community setting.

CJ 4250 (5250). Drugs and Behavioral

Pharmacology.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660. Relationships between drugs or drug groupings and human behavior, including toxicity, behavioral symptoms, and historical aspects of drug abuse.

CJ (SOC) 4515 Sexual Offenses and Offenders.

Lec. 3. Credit 3.

Prerequisite: SOC 1010. This course provides a broad introduction into the world of sexual offenses. Accordingly, this course will provide information on survivors of these crimes, perpetrators, as well as relevant sociological factors. An emphasis will be placed on understanding the perpetrator specifically.

CJ (SOC) 4520. Patterns of Domestic Violence.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or consent of instructor. This course investigates all forms of domestic violence from a sociological perspective including theoretical explanations, prevalence, risk factors, dynamics of prevention, and intervention.

CJ (SOC) 4530. Sociology of Murder.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or consent of instructor. This course provides an analytical study of murder and violence in the United States. As such, course topics include: different types of homicide, offender characteristics, etiological considerations of becoming an offender or victim, the role of social profiling in the investigation of various types of murder, theoretical approaches to the study of murder, and patterns and sources of violence. Taking into account the grisly topic, students that are distributed by particularly heinous crimes should avoid enrolling into this course.

CJ 4540. Women and Crime. Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660. Students must be majoring in SOC, SOC/CJ/, or SOC/SW. Non-majors may be admitted by consent of instructor. This course provides an in-depth analysis on women's involvement in both crime enforcement and crime perpetration. The course examines how societal gender norms and concepts such as "femininity" impact women as law enforcers, perpetrators, and victims of crime.

CJ (SOC) 4660 (5660). Corrections.-Spring. (E).

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Correctional services, practices, and issues with particular attention to the maximum security adult institution.

CJ 4700 (5700). Independent Study. Credit 1-3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of criminology or criminal justice where there is no appropriate course. May be taken twice, provided that the topic is different.

CJ (SOC, SW) 4900 (5900). Internship in Criminal Justice. Credit 3.

Prerequisite: Nine hours of Criminal Justice. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. (May be taken once for upper division credit to fulfill major or minor requirements and a second time as a general elective.)

CJ (SOC) 4911. Geographic Information Applications in the Social Sciences. Lec. 3. Credit 3.

Prerequisites SOC 1010. This course provides a broad introduction into the world of geographic information systems (GIS) and their applicability to the social sciences – particularly criminal justice. Students are required to complete a major research project using GIS applications and to present the results.

CJ (SOC, SW) 4915. Internship. Credit 6.

Prerequisite: Nine hours of sociology. Six hour internships are only available for internships that offer special opportunities that are not available in a 3 hour internship. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 6 hours of credit.

CJ (SOC, SW) 4925. Internship. Credit 9.

Prerequisite: Nine hours of sociology. Nine hour internships are only available for internships that offer special opportunities that are not available in a 3 or 6 hour internship. The great majority of these will be summer internships that require the intern to work a 40 hour week. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 9 hours of credit.

CJ (SOC, SW) 4940. Independent Study. Credit 1.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

CJ (SOC, SW) 4941. Independent Study. Credit 1.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

CJ (SOC, SW) 4948. Independent Study. Credit 2.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

CJ (SOC, SW) 4949. Independent Study. Credit 3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is

no appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper-division credit to fulfill major or minor requirements.

CJ (SOC 4950 (5950), SW 4950 (5950)) 4950.

Independent Study.

Credit 3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

CJ (SOC, SW) 4951. Independent Study.

Credit 3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

CJ 4970 (5970). Special Topics.

Cross-listing: SOC 4970 (5970), SW 4970.

Credit 1, 2, 3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology.

CJ (SOC, SW) 4971-4979. Special Topics.

Credit 1.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

CJ (SOC, SW) 4980 (5980). Special Topics.

Credit 1, 2, 3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice.

CJ (SOC, SW) 4990 (5990). Special Topics.

Credit 1, 2, 3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice.

Cooperative Education (COOP)

COOP 2010. Co-op Off-Campus Assignments.

Credit 1.

Prerequisite: Approval by Office of Career Services and selection by employer. Each course represents one semester of off-campus work experience, practical learning, and training in the student's major field of study.

COOP 2020. Co-op Off-Campus Assignments.

Credit 1.

Prerequisite: Approval by Office of Career Services and selection by employer. Each course represents one semester of off-campus work experience, practical learning, and training in the student's major field of study.

COOP 2030. Co-op Off-Campus Assignments.

Credit 1.

Prerequisite: Approval by Office of Career Services and selection by employer. Each course represents one semester of off-campus work experience, practical learning, and training in the student's major field of study.

COOP 4010. Co-op Off-Campus Assignments.

(Students on second year work assignments)

Credit 1.

Prerequisite: Completion of three semesters of successful work experience, approval by Office of Career Services, and selection by employer. The 4000-series allows students to demonstrate more initiative and creativity and to accept more responsibility.

COOP 4020. Co-op Off-Campus Assignments.

(Students on second year work assignments)

Credit 1.

Prerequisite: Completion of three semesters of successful work experience, approval by Office of Career Services, and selection by employer. The 4000-series allows students to demonstrate more initiative and creativity and to accept more responsibility.

COOP 4030. Co-op Off-Campus Assignments.

(Students on second year work assignments)

Credit 1.

Prerequisite: Completion of three semesters of successful work experience, approval by Office of Career Services, and selection by employer. The 4000-series allows students to demonstrate more initiative and creativity and to accept more responsibility.

COOP 4040. Co-op Off-Campus Assignments.

(Students on second year work assignments)

Credit 1.

Prerequisite: Completion of three semesters of

successful work experience, approval by Office of Career Services, and selection by employer. (when approved). The 4000-series allows students to demonstrate more initiative and creativity and to accept more responsibility.

Curriculum Education (CUED)

CUED 4100. Introduction to Curriculum.

Lec. 3. Credit 3.

Principles for the selection, organization and evaluation of objectives and learning activities for the curriculum K-12.

CUED 4120 (5120). Materials and Methods for Teaching Speech and Theatre.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of speech and elementary and secondary school teaching of theatre.

CUED 4150. Middle Level Curriculum.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: For SEED majors only, FOED 3830. An examination of the philosophy, organization, and curriculum of middle level education, including career awareness and exploration, interdisciplinary team teaching, principles of classroom management, and family involvement in the schools.

CUED 4400 (5400). Teaching Methods for Physical Sciences.

Lec. 3. Credit 3.

This course focuses on teaching methods associated with the physical sciences of physics and chemistry. Students will experience and learn the theories behind inquiry, modeling, and other appropriate classroom instructional methods for physics and chemistry topics. Methods and topics will cover grades K-12 with a strong emphasis on conceptual understanding and vertically-aligned standards-based instruction.

CUED 4700. Educational Data and Assessment.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Prepares teacher candidates to interpret data and apply effective assessment and evaluation in the PreK-12 classroom.

CUED 4800. Student Engagement.

Lec. 3. Credit 3.

Corequisite: ELED 4871 and ELED 4872. This course is designed for Residency I candidates to develop engaging strategies that support and meet the needs of all learners. Candidates will identify and learn to

implement engaging strategies related to students' developmental, cultural, and socioeconomic factors.

CUED 4850 (5850). Workshop in Education.

Credit 1-6.

CUED 4851, 4852, 4853. Workshop in Education.

Credit 1, 2, 3.

The course will provide up-to-date content in emerging educational issues for inservice teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered. May be repeated for credit if the topic is different.

CUED 4856. America Reads.

Credit 1.

This course provides knowledge of the needs, characteristics, and tutoring methods pertaining to children and young adults with whom they will be working. Course may be repeated up to 3 times for a total of 3 credit hours.

CUED 4900 (5900). Study Abroad.

Lec. 1-6 Credit 1-6.

This course provides students the opportunity to engage in a Faculty-led study abroad experience which may involve a service-learning component. All participants must comply with established policy, procedures, and guidelines outlined in the Faculty-led Program Abroad Handbook maintained by Tennessee Tech's Study Abroad Office. Students in the 5000 level course will complete additional work. May be repeated for credit.

Decision Sciences (DS)

Enrollment in junior- or senior-level DS courses requires junior standing. All business majors must have completed the Basic Business Program.

DS 2810. Computer Applications in Business.

Lec. 3. Credit 3.

Management approach to business applications of computer technology. Microcomputers and large scale computers are used in problem solving. Credit cannot be obtained for CSC 1100 in addition to credit for either DS 2810 or FOED 3240.

(INFS 1010, TTP Course)

DS 3500. Internship in Business and Information Technology.

Lec. 3. Credit 3.

Prerequisite: Consent of BIT Internship Coordinator or Department Chairperson, Junior or Senior Standing required.. A directed professional experience in the field of Business and Information Technology.

DS 3515. Internship in Business Intelligence and Analytics. Lec. 3. Credit 3.

Prerequisite: Consent of BIA Internship Coordinator or Department Chairperson, Junior or Senior Standing required.. A directed professional experience in the field of Business Intelligence and Analytics.

DS 3520. Operations Management.

Lec. 3. Credit 3.

Prerequisite: ECON 3610. Management of the processes, resources, and technologies in the production of goods and services.

DS 3540. Quality and Productivity Systems.

Lec. 3. Credit 3.

Prerequisite: DS 3520 or consent of instructor. Contemporary issues in quality and productivity management are examined.

DS 3620. Business Analytics: Data Driven Decision Making. Lec. 3. Credit 3.

Prerequisite: DS 2810, ECON 3610. Business Analytics is the use of data and quantitative methods to help managers gain insight about business operations. This course will provide the fundamental concepts and tools needed to understand the role of business analytics in organizations.

DS 3810. Business Applications of Microcomputers.

Lec. 3. Credit 3.

Prerequisite: DS 2810 or consent of instructor. Cost benefit considerations and development and implementation of microcomputer-based business applications are emphasized.

DS 3840. Management Information Systems.

Lec. 3. Credit 3.

Prerequisite: DS 2810. Management information needs and the technical, economic, and organizational impacts of these needs. Accounting majors must enroll in DS 3840. All other students must enroll in DS 3841.

DS 3841. Management Information Systems.

Lec. 3. Credit 3.

Prerequisite: DS 2810. Management information needs and the technical, economic, and organizational impacts of these needs. Accounting majors must enroll in DS 3840. All other students must enroll in DS 3841.

DS 3850. Business Applications Development.

Lec. 3. Credit 3.

Prerequisite: DS 2810. Introduction to development of business applications. Includes programming concepts such as variables, data types, control structures, and input/output files.

DS 3860. Business Database Management.

Lec. 3. Credit 3.

Prerequisite: DS 2810. Concepts of designing and managing databases in a business environment with emphasis on database design, and normalization.

DS 3870. Business Applications Development II.

Lec. 3. Credit 3.

Prerequisite: DS 3850. Advanced programming skills with emphasis on object-orientation, database integration, and web application development.

DS 4010. Decision Support Systems.

Lec. 3. Credit 3.

Prerequisite: DS 3860 or consent of instructor. A current study of DSS concepts, designs, methodologies, and business applications, including expert systems.

DS 4125. Computer Forensics and Investigations.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Investigation, discovery, and analysis of digital computer evidence. Student work groups use computer hardware and forensic software to perform computer forensic investigations and solve sample cases. Students are introduced to and work with numerous computer forensic tools.

DS 4210. Business Intelligence. Lec. 3. Credit 3.

Prerequisite: DS 3860. Business Intelligence (BI) is the process of collecting data from a variety of sources and providing it to decision-makers in a form that enhances business value. This course will provide an understanding of data organization, BI processes and techniques, and how to transform data to support business decision-making.

DS 4220. Advanced Business Analytics.

Lec. 3. Credit 3.

Prerequisite: DS 3620. This course provides an in-depth examination of the benefits and challenges of implementing analytics in a business environment. It also covers advanced topics in data analysis that will assist managers in making better decisions.

DS 4250. Business Data Communications.

Lec. 3. Credit 3.

Prerequisite: DS 2810. Concepts of data and voice communication networks for supporting business activities to include the OSI model, local and wide area networks, network security, and network management.

DS 4260. Network Security and Forensics.

Lec. 3. Credit 3.

Prerequisite: DS 4250 or consent of instructor. Concepts of network security measures aimed at preventing unwanted access to a network and network forensics

aimed at capturing and inspecting network traffic for later analysis.

DS 4330 (5330). Management Information Systems Analysis and Design. Lec. 3. Credit 3.

Prerequisite: DS 3860 or consent of instructor. An applications oriented study of the business systems development life cycle and current systems analysis and design methods are emphasized.

DS 4510. Business Intelligence and Analytics Capstone. Lec. 3. Credit 3.

Prerequisite: DS 4210. Prerequisite or corequisite: DS 4220. This course brings together foundations of business intelligence and analytics by using a wide array of techniques to solve real-world business problems and support business decision-making.

DS 4550. Information Systems Development Practicum. Lec. 3. Credit 3.

Prerequisite: DS 3870 and DS 4330 (5330). Corequisite: DS 4250. Students develop their knowledge and skills in planning, analyzing, designing, and implementing real-world information systems.

DS 4630 (5630). Advanced Quantitative Analysis.

Lec. 3. Credit 3.

Prerequisite: DS 3620. Advanced applications of quantitative methods, including forecasting and management science concepts.

DS 4900 (5900). Special Topics in Decision Sciences.

Lec. 1-3. Credit 1-3.

Prerequisite: Consent of instructor. Current topics in Decision Sciences.

DS 5050. Quantitative Techniques for Business.

Lec. 3. Credit 3.

Classical and modern optimization techniques and concepts. Basic review and introduction to business applications of probability, statistics, and management science methods.

Early Childhood Education (ECED)

ECED (ECSP) 3001. Curriculum for Infants, Toddlers & Preschoolers. Lec. 3. Credit 3.

Prerequisite: HEC 2200. Survey of developmentally appropriate curricula for young children through age five with emphasis on creative activities, books and materials, toys, teacher-made resources, and software and specialized curricula for children with special needs.

ECED (ECSP) 3200. Procedures for Infants, Toddlers & Preschoolers. Lec. 3. Credit 3.

Prerequisite: HEC 2200, CFS 2400, and ECED 3001 or the equivalents. Corequisite: ECED 3211 or ECSP 3211.

Planning and implementing developmentally appropriate practices for typically and atypically developing infants, toddlers, and preschoolers, including procedures for working with their families.

ECED (ECSP) 3211. Practicum: Procedures for Infants, Toddlers & Preschoolers.

Lab. 1. Credit 1.

Prerequisite: HEC 2200, CFS 2400, or the equivalents; full admission to the Teacher Education Program.

Corequisite: ECED 3001. Supervised teaching and intervening with infants, toddlers, and preschoolers and their families in varied educational settings. A minimum grade of B is required to meet degree requirements.

ECED 3301. Math, Science, Social Studies for the Young Child. Lec. 7. Credit 7.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECED 3310. Developmentally appropriate materials and methods for integrated learning experiences in mathematics, science and social studies. Focus is on diverse and inclusive populations ages B-8. Includes practicum experiences.

ECED 3310. Practicum: Concepts for Young Children.

Lab. 4. Credit 1.

Corequisite: ECED 3301 and Full admission to the Teacher Education Program. Supervised teaching of integrated learning experiences in appropriate settings for preschooler-Grade 4 students. A minimum grade of B is required to meet degree requirements.

ECED (ECSP) 4000. Developmentally Appropriate Practices: Birth – Preschool.

Lec. 3. Lab. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Integrated learning experiences with emphasis on approaches, teaching strategies, and management.

ECED (ECSP) 4100. Developmentally Appropriate Practices: K-4. Lec. 2. Lab. 4. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Curriculum, instruction, management, and assessment for grades K-4 in diverse and inclusive settings. Includes practicum. A minimum grade of B is required to meet degree requirements.

ECED 4221. Early Intervention Field Experience.

Lab. 1. Credit 1.

Prerequisite: Full admission to the Teacher Education Program, ECED 4230. Co-requisite: ECED 4240. Gain perspectives of children, families, and professionals in the early intervention system. Field experience focuses on family/professional interactions and implementation of IFSP goals. A grade of B or better must be earned to advance to internship.

ECED 4230 (5230). Early Intervention I.

Lec. 3. Credit 3.

Prerequisite: CFS 2400. Methods of service delivery for infants and toddlers with developmental delays and their families. Effective consultation, trans-disciplinary collaboration, service coordination, family centeredness, and culturally responsive practices.

ECED 4240 (5240). Early Intervention II.

Lec. 3. Credit 3.

Prerequisite: ECED 4230. Co-requisite: ECED 4221. Best practices in early intervention for a variety of special needs. Methods and curriculum development to enable effective reciprocal relationships with families.

ECED 4260. Early Childhood Program Leadership, Administration, and Assessment.

Lec. 8. Credit 8.

Prerequisite: CFS 2400. Course content focuses on early childhood leadership skills, administration, and assessment. Participants gain knowledge and skills in the planning, implementation, and evaluation of early childhood programs. In addition, assessment of administrator knowledge, skills, and experience will be conducted.

ECED 4270. Early Childhood Internship I.

Lab. 5. Credit 5.

Prerequisites: ECED 4230, ECED 4240, ECED 4221, ECED 4260. Co-requisite: ECED 4280. Supervised work experience in an early childhood related field with professional-level responsibilities.

ECED 4280. Early Childhood Internship II.

Lab. 7. Credit 7.

Prerequisites: ECED 4230, ECED 4240, ECED 4221, ECED 4260. Co-requisite: ECED 4270. Continued, supervised work experience in an early childhood related field with professional-level responsibilities.

ECED 4290 (5290). Community Connections.

Lec. 3. Credit 3.

Prerequisite: CFS 2400. Survey of community resources for families and young children, with an emphasis on federal, state, and local programs.

ECED (ECSP) 4300 (5300). Assessment of Young Children.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program; CFS 2400 or consent of instructor. Theories, principles, and practices associated with child find, assessment, and evaluation of young children, their families, and their environments.

ECED (LSCI) 4530 (5530). Books and Related Materials for Infants and Toddlers.

Lec. 1. Credit 1.

Survey of developmentally appropriate books and materials for infants, toddlers, and preschoolers.

ECED 4840 (5840). Seminar: Language Acquisition from Birth to Five Years.

Lec. 1. Credit 1.

Prerequisite or corequisite: ECED 4290 (5290). Study of early language development, problems and acquisition in children from birth to five years of age.

ECED (ECSP) 4870. Student Teaching I.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECED 4880 and ECED 4890.

Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom. A minimum grade of B is required to meet degree requirements.

ECED (ECSP) 4880. Student Teaching II.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECED 4870 and ECED 4890.

Continuation of ECED 4870 in a different setting.

ECED 4890. Student Teaching Seminar.

Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECED 4870 and ECED 4880.

Seminar on issues of student teaching with special emphasis on classroom management.

Early Childhood Special Education (ECSP)**ECSP (CFS) 2400. Children with Special Needs.**

Lec. 3. Credit 3.

Knowledge of risk factors, developmental delay, and categories of disability. Understanding of special education and its emphasis on prevention, early intervention, and services in normal environments. Practicum embedded into course.

ECSP (CFS) 2410. Practicum: Children with Special Needs.

Lab. 4. Credit 1.

Supervised participation in service delivery settings.

ECSP (ECED) 3001. Curriculum for Infants, Toddlers & Preschoolers.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program; HEC 2200. Survey of developmentally appropriate curricula for young children through age five with emphasis on creative activities, books and materials, toys, teacher-made resources, software, and specialized curricula for children with special needs.

ECSP (ECED) 3200. Procedures for Infants, Toddlers & Preschoolers.

Lec. 3. Credit 3.

Prerequisite: HEC 2200, CFS 2400, and ECED 3001 or

the equivalents. Corequisite: ECSP 3211 or ECED 3211. Planning and implementing developmentally appropriate practices for typically and atypically developing infants, toddlers, and preschoolers, including procedures for working with their families.

ECSP (ECED) 3211. Practicum: Procedures for Infants, Toddlers & Preschoolers.

Lab. 1. Credit 1.

Prerequisite: HEC 2200, CFS 2400 or the equivalents, and Full admission to the Teacher Education Program. Corequisite: ECSP 3001. Supervised teaching and intervening with infants, toddlers, and preschoolers and their families in varied educational settings. A minimum grade of B is required to meet degree requirements.

ECSP (ECED) 4000. Developmentally Appropriate Practices: Birth-Preschool.

Lec. 3. Lab. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Integrated learning experiences with emphasis on approaches, teaching strategies, and management.

ECSP (ECED) 4100. Developmentally Appropriate Practices: K-4.

Lec. 3. Lab. 4. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Curriculum, instruction, management, and assessment for grades K-4 in diverse and inclusive settings. Practicum embedded into course. A minimum grade of B is required to meet degree requirements.

ECSP (ECED) 4300 (5300). Assessment of Young Children.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program; CFS 2400 or consent of instructor. Theories, principles and practices associated with child find, assessment, and evaluation of young children, their families, and their environments.

ECSP (ECED) 4870. Student Teaching I.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECSP 4880 and ECSP 4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom. A grade of B is required to meet degree requirements.

ECSP 4871. Residency I.

Credit 5.

Prerequisite: ECED 3310 and FOED 3810 grade B or better; full admission to the Teacher Education Program. Corequisite: ECSP 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A

minimum grade of B is required to meet degree requirements.

ECSP 4872. Professional Seminar I.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECSP 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

ECSP (ECED) 4880. Student Teaching II.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECSP 4870 and ECSP 4890. Continuation of ECSP 4870 in a different setting. A grade of B is required to meet degree requirements.

ECSP 4881. Residency II.

Credit 10.

Prerequisite: ECSP 4871 with a grade of B, and full admission to the Teacher Education Program. Corequisite: ECSP 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

ECSP 4882. Professional Seminar II.

Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECSP 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

ECSP (ECED) 4890. Seminar: Student Teaching/Internship.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECSP 4870 and ECSP 4880. Examination of important professional topics, including a personal and professional profile, a portfolio, a resume, professional behavior, and professional organizations. Analysis of personal and professional resources.

Economics (ECON)

Enrollment in Junior- or Senior-level ECON courses requires junior standing. All business majors must have completed the Basic Business Program.

◆ECON 2010. Principles of Microeconomics.

Lec. 3. Credit 3.

Supply and demand, theory of demand, principles of production, pricing, and distribution. Output market

structures, labor markets and issues, and international trade.

(ECON 2020, TTP Course)

◆ **ECON 2020. Principles of Macroeconomics.**

Lec. 3. Credit 3.

Aggregate supply and aggregate demand, employment and income determination, money and banking, monetary and fiscal policy, and international finance.

(ECON 2010, TTP Course)

ECON 3320. Money and Banking.

Lec. 3. Credit 3.

Prerequisite: ECON 2020. Principles of money, banking, and the financial system; the impact of money on economic activity.

ECON 3610. Business Statistics I.

Lec. 3. Credit 3.

Prerequisite: MATH 1830 or consent of instructor.

Statistical description, probability, probability distributions (binomial, normal, and t), sampling distributions, hypothesis testing, chi-square and F-distributions, and linear regression.

ECON 3630. Business Statistics II.

Lec. 3. Credit 3.

Prerequisite: ECON 3610. Hypothesis testing, multiple regression, other multivariate techniques, time series analysis and forecasting, and decision-making under uncertainty.

ECON 3810. Intermediate Microeconomics.

Lec. 3. Credit 3.

Prerequisite: ECON 2010. Microeconomic analysis at the intermediate level; consumer behavior, firm production theory, pricing, and industrial organization.

ECON 3820. Intermediate Macroeconomics.

Lec. 3. Credit 3.

Prerequisite: ECON 2020. Measurement, analysis, and control of aggregate economic activity; public finance.

ECON 3830. Managerial Economics.

Lec. 3. Credit 3.

Prerequisite: ECON 2010 and ECON 3610. Theory and estimation of demand, production, and costs. Pricing and output decisions under different market structures, financial investment, government and business, and international business.

ECON 4120. Natural Resource Economics.

Lec. 3. Credit 3.

Prerequisite: AGBE 2100 or ECON 2010. Static and dynamic models of renewable and non-renewable resource allocation. Application of principles of economics will identify the causes, consequences, and ways of dealing with natural resource problems,

including problems associated with fisheries, forests, water problems, and land.

ECON 4200. Environmental Economics.

Lec. 3. Credit 3.

Prerequisite: AGBE 2100 or ECON 2010. A detailed study of the economic foundations of Environmental Policy and common tools used by environmental economists to measure and analyze benefits and costs of environmental regulation and consider the characteristics of efficient regulation.

ECON 4310 (5310). Labor Economics.

Lec. 3. Credit 3.

Prerequisite: ECON 2010, ECON 2020, and one of the following: ECON 3320, ECON 3810, or ECON 3820. Labor problems including economics of the labor market, wages, demand and supply of labor, and unemployment.

ECON (FIN) 4510 (5510). International Trade and Finance.

Lec. 3. Credit 3.

Prerequisite: ECON 2010, ECON 2020, and one of the following: ECON 3320, ECON 3810, or ECON 3820. International trade, monetary exchange, balance of payments, and foreign investments.

ECON 4520 (5520). Comparative Economic Systems.

Lec. 3. Credit 3.

Prerequisite: ECON 2020. Analysis of essential economic features of the economic systems.

ECON 4530 (5530). History of Economic Thought.

Lec. 3. Credit 3.

Prerequisite: ECON 2020. Development of economic doctrines and schools and economic thought from the mercantilist period to the present.

ECON 4600 (5600). Economic Growth and Development.

Lec. 3. Credit 3.

Prerequisite: ECON 2020. A critical survey of growth and strategies of economic development, including regional growth and development; historical evidence of development.

ECON 4640 (5640). Econometrics.

Lec. 3. Credit 3.

Prerequisite: ECON 2010, ECON 2020, ECON 3610, and one of the following: ECON 3320, ECON 3810, or ECON 3820. An advanced treatment of statistical models applied to economics, including the general linear model, heteroscedasticity, autocorrelation, multicollinearity, simultaneous equations, and other violations of OLS assumptions.

ECON 4900 (5900). Contemporary Economics Workshop.

Credit 1 to 6.

Thorough and intensive training of public school

teachers in fundamental economic principles and current issues. May not be counted as part of a degree program in the College of Business.

ECON 4990. Special Topics.

Credit 3 to 6 per semester. Maximum 6.
Directed study and research on a selected topic in economics. Available to senior economics majors on an individual basis with consent of departmental chairperson.

ECON 5030. Fundamentals of Economics.

Lec. 3. Credit 3.
Production and distribution of wealth and income and other basic principles of the market economy.

◆ **Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).**

Educational Psychology (EDPY)

EDPY 2210. Educational Psychology.

Lec. 3. Credit 3.
Human growth and learning, nature of the learning process, factors that affect the learner, and application of psychological principles to teaching.

EDPY 3300. Evaluation and Guidance.

Lec. 3. Credit 3.
Major types of evaluation procedures, construction of evaluative instruments, and functions of the classroom teacher in evaluation.

Electrical and Computer Engineering (ECE)

ECE 1020. Connections to Electrical and Computer Engineering.

Rec. 2. Credit 1.
Prerequisite: Freshman Standing. Engages the student in academic and non-academic, out-of-classroom activities to facilitate transition into the electrical or computer engineering program. Faculty interaction, peer mentoring, professional student organizations and electronic kit construction.

ECE 2001. Computer Aided Engineering in ECE.

Lec. 1. Credit 1.
Prerequisite: C or better in CSC 1300 or CSC 2100, C or better in ECE 2010 and C or better in MATH 2010 (ECE 2010 and may be taken concurrently). Engineering problem formulation for computer calculations. Computer aided engineering software with applications in electrical and computer engineering.

ECE 2010. Electric Circuits I.

Lec. 3. Credit 3.
Prerequisite: C or better in MATH 1920, C or better in MATH 2010 and C or better in MATH 2120 (MATH 2120

may be taken concurrently). Introduction to electric circuit quantities and components, systematic application of Ohm's and Kirchhoff's laws, superposition, Thévenin and Norton theorems, operational amplifiers, RL and RC transients, and circuit simulation with SPICE. Circuit applications of probability.

ECE 2011. Electrical Engineering Lab I.

Lab. 3. Credit 1.
Prerequisite: C or better in ECE 2010 (ECE 2010 may be taken concurrently). Introduction to electrical and electronic components, circuits, test equipment, and measurement techniques.

ECE 2020. Electric Circuits II.

Lec. 3. Credit 3.
Prerequisite: C or better in ECE 2010, C or better in ECE 2011, C or better in MATH 2010, C or better in MATH 2120 either C or better in ECE 2001 or C or better in ME 3001 (ECE 2001, ECE 2011 and/or ME 3011 may be taken concurrently). Laplace transform methods for electric circuit analysis. Sinusoidal steady-state and power, mutual inductance, 3- phase circuits, frequency response, Bode plots, resonance, and filters. Circuit simulation with SPICE.

ECE 2110. Introduction to Digital Systems.

Lec. 3. Credit 3.
Prerequisite: C or better in CSC 1300 or CSC 2100. Basic concepts in the design and analysis of digital systems. Number systems and codes. Combinational circuit analysis and design using Boolean algebra. Sequential logic circuit analysis and design.

ECE 3010. Signals and Systems.

Lec. 3. Credit 3.
Prerequisite: C or better in ECE 2001 and C or better in ECE 2020. Time-domain and frequency-domain analysis of signals and systems, applications of Fourier series, Fourier transform, and Laplace transform in circuits and systems; Analog filters.

ECE 3020. Discrete-Time Signals and Systems.

Lec. 3. Credit 3.
Prerequisite: C or better in ECE 3010. Signal sampling and reconstruction. Difference equations, Z-transforms, and the discrete Fourier transform. Fundamentals of digital filters.

ECE 3060. Electrical Engineering Lab II.

Lab. 3. Credit 1.
Prerequisite: C or better in ECE 2011, C or better in ECE 3010 and C or better in ECE 3300. (ECE 2020, ECE 3010 and/or ECE 3300 may be taken concurrently.) Electrical and electronic circuits and measurement techniques, amplifiers, active and passive filters, switching circuits.

ECE 3130. Microcomputer Systems.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: C or better in CSC 1300 or CSC 2100, C or better in ECE 2011, and C or better in ECE 2110.

Microcomputer system architecture. Software/hardware analysis. Programming microcomputer system using Assembly and C languages. Design hardware subsystem and integration with microcontroller for engineering application.

ECE 3160. Digital Systems Lab. Lab. 3. Credit 1.

Prerequisite: C or better in ECE 2011 and C or better in ECE 2110. Hardware considerations and performance of combinational and sequential digital devices including gates, flip-flops, multiplexers, and decoders.

ECE 3210. Control System Analysis.

Lec. 3. Credit 3.

Prerequisite: PHYS 2110 and C or better in ECE 3010 or ME 3050. Modern and classical methods of control system analysis of continuous-time systems. Introduction to design tools.

ECE 3260. Control System Lab. Lab. 3. Credit 1.

Prerequisite: C or better in ECE 3060 and C or better in ECE 3210. (ECE 3210 may be taken concurrently). Simulation of dynamic systems. Demonstration of control system analysis and design techniques using hardware experiments.

ECE 3270. Programmable Logic Controller Laboratory.

Lab. 3. Credit 1.

Prerequisite: C or better in ECE 3060, C or better in ME 3023, or C or better in CHE 2020, or C or better in CEE 3030, or C or better in MET 3200. Introduction to Ladder Logic Programming, Relays, PLC in Automation & Control, Safety, Hardware Troubleshooting, Hands-on laboratory experiments and projects.

ECE 3300. Electronics I. Lec. 3. Credit 3.

Prerequisite: C or better in ECE 2011 and C or better in ECE 2020. Introduction to semiconductor junction devices and their physical operation, mid-band equivalent circuits, single and multi-stage amplifiers, digital electronics and SPICE simulation.

ECE 3310. Electronics II. Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3300. Differential amplifiers, frequency response, negative feedback, power output stages, and SPICE simulation.

ECE 3360. Electronics Lab. Lab. 3. Credit 1.

Prerequisite: C or better in ECE 3060 and C or better in ECE 3300. Diodes, BJTs, FETs, and amplifier circuits.

ECE 3510. Electromagnetic Fields I.

Lec. 3. Credit 3.

Prerequisite: PHYS 2120 and C or better in MATH 2110. Development of Maxwell's equations for electric and magnetic fields. Electromagnetic properties of materials. Wave equation, plane waves, and Lorentz force law.

ECE 3540. Physical Electronics. Lec. 3. Credit 3.

Prerequisite: PHYS 2120. Quantum and wave theory in metals and semiconductors, carrier density, and current relations. Models for basic semiconductor devices.

ECE 3560. EM Simulation Lab. Lab. 3. Credit 1.

Prerequisite: C or better in ECE 3060 and C or better in ECE 3510. Simulation and design of phenomena and devices with EM fields and waves.

ECE 3610. Introduction to Power Systems.

Lec. 3. Credit 3.

Prerequisite: PHYS 2120 and C or better in ECE 2020. Overview of electric power systems, magnetic circuits and transformers, electromechanical energy conversion, rotating machines, power system operation and control, and current issues in power systems.

ECE 3660. Electric Power Lab. Lab. 3. Credit 1.

Prerequisite: C or better in ECE 3060 and C or better in ECE 3610. Operation of various power system components, design tests of transformers, speed control characteristics of various types of motors and generators, and computer simulation of power system operation.

ECE 3710. Introduction to Telecommunications.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3010 and C or better in MATH 3470 (MATH 3470 may be taken concurrently). Introduction to Digital Telecommunications, including coding, communication networks, spectral analysis, and digital modulation and demodulation.

ECE 3760. Telecommunications Lab.

Lab. 3. Credit 1.

Prerequisite: C or better in ECE 3060 and C or better in ECE 3710. Telecommunication system measurements.

ECE 3810. Fundamentals of Electrical Engineering.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 1920. An introduction to fundamental principles of electrical circuits, DC and AC circuit analysis techniques, electric power systems, electric motors, diodes and rectifiers, operational amplifiers, frequency response and filters. Will not count for credit for Electrical Engineering or Computer Engineering majors.

ECE 3860. Fundamentals of Electrical Engineering Lab.

Lab. 3. Credit 1.

Prerequisite: ECE 3810 (ECE 3810 can be taken concurrently). Basic instrumentation and component laboratory. Use of instruments in DC and AC measurements. Demonstration of circuit concepts. Characteristics of diodes, operational amplifiers and AC filters. Simple digital logic circuits. Will not count for credit for Electrical Engineering or Computer Engineering majors.

ECE 3920. Professional Issues in Electrical and Computer Engineering.

Lec. 1. Rec. 1. Credit 1.

Prerequisite: Junior Standing, C or better in ECE 2020, and either C or better in COMM 2025 or C or better in PC 2500. (COMM 2025 or PC 2500 may be taken concurrently.) Professional topics in Engineering, verbal technical communications.

ECE 4020 (5020). Digital Signal Processing.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3020 and C or better in ECE 3130. (ECE 3130 may be taken concurrently.) Introduction to the theory and practice of discrete-time signals and systems, A/D and D/A conversion, filter design, DSP Architecture and implementation, programming, DSP applications.

ECE 4110 (5110). Digital System Design.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 2110 and C or better in ECE 3160. Computer-aided combinational and sequential digital logic analysis, design, and applications, utilizing both standard digital components and programmable logic devices.

ECE 4120 (5120). Fundamentals of Computer Design.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3130 and C or better in ECE 4110 (5110). Continuation of digital system design concepts and applications with emphasis on computer hardware design: CPU sequencers, arithmetic/logic units, fixed and floating point arithmetic implementations, and computer peripheral interfacing, utilizing programmable logic.

ECE 4130 (5130). Introduction to Digital VLSI.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 2110 and C or better in ECE 3300. Analysis, design and layout of complex digital integrated circuits in MOS technology. The course emphasizes design through projects and requires extensive use of simulation and layout VLSI CAD tools.

ECE 4140. Embedded System Design.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: C or better in ECE 3130. Basic hardware and software concepts in the analysis and design of embedded systems, peripheral interfaces and performance analysis with hands-on design project.

ECE 4210 (5210). Control System Design.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3210 and C or better in ECE 3260. Design of compensators using frequency domain techniques; Design projects with hardware implementation.

ECE (ME) 4370 (5370). Mechatronics and Intelligent Machines Engineering.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: C or better in ECE 3130 and C or better in ECE 3160. Mechatronics; number systems; microcontroller technology and architecture of 8-bit microcontrollers (e.g. Motorola MC68HC110); assembly language programming; A/D and D/A conversion; parallel I/O; programmable timer operation; interfacing sensors and actuators; applications; and team project on design and implementation of a mechatronic system.

ECE 4510 (5510). Electromagnetic Fields II.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3510. Polarization, Poynting's vector, transmission lines, waveguides, and radiation.

ECE 4520 (5520). Optoelectronic Engineering.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3540. Device theory for optical communication and instrumentation systems.

ECE 4610 (5610). Power System Analysis.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3610. Power system components modeling in steady state, per unit calculations, transmission line steady state operation, power flow analysis, applications of commercial software.

ECE 4620 (5620). Power System Operation and Control.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 4610 (5610). Symmetrical components, fault analysis, system protection, transient stability, power system controls including: automatic generation control, voltage regulation, and economic dispatch.

ECE 4630 (5630). Power Electronics.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3300 and C or better in ECE 3610. Uncontrolled and controlled rectifiers, voltage controllers, chopper, dc motor control, pulse-width

modulation inverters, induction motor control, and power supplies.

ECE 4710 (5710). Principles of Telecommunications.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 3710 and C or better in MATH 3470. Performance of analog and digital communication systems in the presence of noise.

ECE 4720 (5720). Telecommunication Systems Design.

Lec. 3. Credit 3.

Prerequisite: C or better in ECE 4710 (5710). Link budget, synchronization, frequency synthesis, receiver architecture, noise and distortion, error correction codes, spread-spectrum systems.

ECE 4931. Research Topics.

Credit 1.

Prerequisite: Consent of instructor. Development of research proposal including problem definition, literature review, and identification of potential research approaches.

ECE 4932. Research Topics.

Credit 2.

Prerequisite: Consent of instructor. Execution of research proposal developed in ECE 4931, culminating in a final report including experimental or simulation results.

ECE 4933. Research Topics.

Credit 3.

Prerequisite: Consent of instructor. Development of research proposal including problem definition, literature review, and identification of potential research approaches. Execution of research proposal developed, culminating in a final report including experimental or simulation results.

ECE 4961. Capstone Design I.

Lec. 2. Lab. 4. Credit 3.

Prerequisite: C or better in ECE 3020, C or better in ECE 3060, C or better in ECE 3130, C or better in ECE 3300, C or better in ECE 3920, and either C or better in COMM 2025 or C or better in PC 2500. (ECE 3020 may be taken concurrently). The first in a sequence of two capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design review, subsystem development, testing, weekly reporting, documentation, and oral presentation.

ECE 4971. Capstone Design II.

Lec. 2. Lab. 4. Credit 3.

Prerequisite: ECE 4961. The second in a sequence of two senior capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design

review, implementation, testing, weekly reporting, documentation, and oral presentation.

ECE 4990 (5990). Special Problems.

Credit 1-6 Per Semester, Maximum 12.

Prerequisite: Consent of instructor. Current topics in electrical engineering in the form of a reading course or an experimental lecture course. (Because of the impossibility of duplicating the conditions of a special topic(s), this course may not be repeated for the improvement of a grade.)

Elementary Education (ELED)

ELED 2100. Problem Solving for Technological Literacy.

Lec. 3. Credit 3.

Prerequisite: FOED 2011 and FOED 1822 or FOED 1820. Course is designed to provide opportunities for preservice K-6 teachers to explore problems that arise naturally in the world and to develop their critical thinking and problem solving skills. This course will focus on the development of technological literacy among future educators. This course will encourage teachers to capitalize on students' natural curiosity about the world and how it works. Education and Engineering faculty will work in collaboration to develop and facilitate real-world problem solving experiences designed to develop a more technologically literate citizenry.

ELED 3140. Teaching of Social Studies.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 3152, ELED 4142, FOED 3800. Current practices, research, innovations, and unit method are emphasized.

ELED 3151. Teaching of Language Arts and Writing.

Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 3140, ELED 3152, ELED 4140. While implementing the writing process, candidates will review, explore, and apply grammatical and mechanical aspects of writing in various genres, for different purposes and audiences, and across content areas.

ELED 3152. Teaching of Mathematics.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 3140, ELED 4142, FOED 3800. Use of modern methods and strategies for teaching mathematics and translating theory into practice.

ELED 3872. Professional Seminar I.

Credit 5.

Corequisite: ELED 4871. Seminar for residency I candidates to develop curriculum, identify effective

instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

ELED 4140. Science for Elementary Teachers.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 3140, ELED 3152, FOED 3800. Curricula content of elementary school science including materials and methods of developing understanding and skills in science for children.

ELED 4142. Teaching of Science. Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 3140, ELED 3152, FOED 3800. Curricula content of elementary school science including materials and methods of developing understanding and skills in science for children.

ELED 4250 (5250). Language Arts and Communication Skills.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Relationship of language development and thinking to teaching communications skills to children in the middle grades.

ELED 4870. Student Teaching I. Credit 5.

Prerequisite: The prerequisite to all upper-division education courses is full admission to the Teacher Education Program. Corequisite: ELED 4880 and ELED 4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom. A grade of B is required to meet degree requirements.

ELED 4871. Residency I. Credit 5.

Prerequisite: FOED 3800 and FOED 3810 with a grade of "B" or better, full admission to the Teacher Education Program and full admission to Residency I. Corequisite: ELED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

ELED 4872. Professional Seminar I. Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

ELED 4880. Student Teaching II. Credit 5.

Prerequisite: The prerequisite to all upper-division

education courses is full admission to the Teacher Education Program. Corequisite: ELED 4870 and ELED 4890. Continuation of ELED 4870 in a different setting. A grade of B is required to meet degree requirements.

ELED 4881. Residency II.

Credit 10.

Prerequisite: ELED 4871 with a grade of B, full admission to the Teacher Education Program. Corequisite: ELED 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

ELED 4882. Professional Seminar II. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

ELED 4890. Seminar: Education and Society.

Credit 2.

Prerequisite: The prerequisite to all upper-division education courses is full admission to the Teacher Education Program. Corequisite: ELED 4870 and ELED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Engineering (ENGR)

ENGR 1020. Connections to Engineering and Technology.

Rec. 2. Credit 1.

Prerequisite: Freshman Standing. Engages the student in meaningful academic and non-academic, out-of-the classroom activities involving engineering and technology. Emphasizes critical thinking in the formation of academic and social goals and support groups and in self-management and study skills.

ENGR 1110. Engineering Graphics.

Lec. and Lab. 4. Credit 2.

Visualization skills and graphic communication techniques for engineers, sketching, computer-aided drafting, and solid modeling, drawing interpretation.

ENGR 1120. Programming for Engineers.

Lec. and Lab. 4. Credit 2.

Prerequisite: ACT Math score of 27 or above, or MATH 1720, MATH 1730, MATH 1845, or MATH 1910. (MATH 1845 or MATH 1910 can be taken concurrently.)

Problem definition, algorithm development, flowcharting, and structured programming using a high level language.

ENGR 1210. Introduction to Engineering.

Lec. and Lab. 2. Credit 1.

Introduction to engineering and engineering technology, the engineering problem solving method, engineering design, and engineering ethics.

ENGR 1310. Excel and Visual Basic for Engineers.

Lec. and Lab. 4. Credit 2.

Prerequisite: Algebra. Problem definition, algorithm development, flowcharting/pseudocode, spreadsheet fundamentals, structured programming using Excel/VBA and Visual Basic, and engineering applications of spreadsheets and programming.

ENGR 2121. Engineering Applications in C.

Lec. and Lab. 2. Credit 1.

Prerequisite: ENGR 1120. Corequisite: MATH 1920. C language programming for engineering applications. Effective use of functions, arrays, pointers, and data structures. Modular program design. Program validation and documentation.

ENGR 2810. Electrical Engineering Fundamentals I.

Lec. 3. Credit 3.

Prerequisite: MATH 1920. An introduction to fundamental principles of electrical circuits, DC and AC circuit analysis techniques. First and second order transients. Frequency response and filters. Digital logic circuits. Circuit simulation with SPICE.

ENGR 2820. Electrical Engineering Fundamentals II.

Lec. 3. Credit 3.

Prerequisite: ENGR 2810. Continuation of ENGR 2810. Electronic devices and circuits including diodes, transistors and op amps. Transformers and electromechanics of DC and AC machines. Circuit simulation with SPICE.

ENGR 2821. Electrical Engineering Fundamentals Lab.

Lab. 3. Credit 1.

Prerequisite: ENGR 2820 (ENGR 2820 may be taken concurrently). Introduction to electrical and electronic components, circuit construction, test equipment, and measurement techniques; DC and AC measurements, applications of transistors, operational amplifiers, and digital logic.

ENGR 2991. Special Problems.

Credit 1.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 2992. Special Problems.

Credit 2.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 2993. Special Problems.

Credit 3.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 2994. Special Problems.

Credit 4.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 3120. Solid Modeling.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ENGR 1110, CEE 3110. (CEE 3110 may be taken concurrently.) Introduction to computer-aided 3D solid modeling.

ENGR 3851. Internships for Exchange Students in the College of Engineering.

Credit 1. Maximum 6.

Prerequisite: Consent of instructor. Directed study and research on selected areas for international students while participating in an exchange program at Tennessee Tech.

ENGR 3852. Internships for Exchange Students in the College of Engineering.

Credit 2. Maximum 6.

Prerequisite: Consent of instructor. Directed study and research on selected areas for international students while participating in an exchange program at Tennessee Tech.

ENGR 3853. Internships for Exchange Students in the College of Engineering.

Credit 3. Maximum 6.

Prerequisite: Consent of instructor. Directed study and research on selected areas for international students while participating in an exchange program at Tennessee Tech.

ENGR 3951, 3952, 3953. Special Topics for Non-Engineers.

Credit 1, 2, 3. Maximum 6.

Prerequisite: Consent of instructor. Timely topics in engineering and technology—the relationships to other professions. This course may not be used to earn credit toward an Engineering degree.

ENGR 4510 Engineering Management.

Lec. 3. Credit 3.

Prerequisite: Senior Standing in an Engineering discipline. Management theory applied to engineering and technical organizations. Topics include management functions in an engineering context;

engineering techniques and tools for management; project management; management/leadership of technical people and teams; and contemporary engineering management topics, e.g., rapid technological change and globalization.

ENGR 4851. International Experiences for College of Engineering Students. Credit 1. Maximum 6.

Prerequisite: Consent of instructor. Directed study and research on selected areas while participating in international experience as a Tennessee Tech College of Engineering student.

ENGR 4852. International Experiences for College of Engineering Students. Credit 2. Maximum 6.

Prerequisite: Consent of instructor. Directed study and research on selected areas while participating in international experience as a Tennessee Tech College of Engineering student.

ENGR 4853. International Experiences for College of Engineering Students. Credit 3. Maximum 6.

Prerequisite: Consent of instructor. Directed study and research on selected areas while participating in international experience as a Tennessee Tech College of Engineering student.

ENGR 4900 Professionalism and Ethics.

Lec. 3. Credit 3.

Prerequisite: Senior Standing. Professional, social and ethical issues in engineering practice.

ENGR 4950 Senior Design I. Lec. 2. Lab. 4. Credit 3.

Prerequisite: ECE 2020, ME 3023, ME 3210 and Senior Standing. The first is a sequence of two capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design review, subsystem development, testing, weekly reporting, documentation, and oral presentation.

ENGR 4960. Senior Design II.

Lec. 2. Lab. 4. Credit 3.

Prerequisite: ENGR 4950. The second in a sequence of two senior capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design review, implementation, testing, weekly reporting, documentation, and oral presentation.

ENGR 4991. Special Problems.

Credit 1.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom

setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 4992. Special Problems.

Credit 2.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 4993. Special Problems.

Credit 3.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

ENGR 4994. Special Problems.

Credit 4.

Prerequisite: Consent of Departmental Chairperson. Special topics in a traditional or nontraditional classroom setting; individual or group research; or faculty-directed readings. May not be repeated to improve a grade.

English (ENGL)

ENGL 1010 and ENGL 1020 and one course from among ENGL 2130, ENGL 2235, and ENGL 2330 are prerequisites for all Upper Division courses. The prerequisite for Upper Division courses of ENGL 2130 or ENGL 2235 or ENGL 2330 is waived for ENGL and SEEN majors.

(O) and (E) Denote Odd and Even Years Respectively

◆ **ENGL 1010. English Composition I.**

Lec. 3. Credit 3.

Introduces students to expressive, expository and persuasive writing. Assignments are based on personal experience and research. Student must earn a grade of C or better to pass.

◆ **ENGL 1020. English Composition II.**

Lec. 3. Credit 3.

Prerequisite: ENGL 1010. Builds on writing and research processes taught in ENGL 1010; emphasizes critical reading, critical thinking, and critical writing (persuasion) about a variety of written texts and other media. Student must earn a grade of C or better to pass.

◆ **ENGL 2130. Topics in American Literature.**

Lec. 3. Credit 3.

Prerequisite: ENGL 1020. Not for ENG or SEEN majors. Representative authors, periods, or themes from the colonial period to the present.

◆ **ENGL 2235. Topics in British Literature.**

Lec. 3. Credit 3.

Prerequisite: ENGL 1020. Not for ENG

majors. Representative authors, periods, or themes from Old English to the present.

◆ENGL 2330. Topics in World Literature.

Lec. 3. Credit 3.

Prerequisite: ENGL 1020. Representative authors, periods, or themes from various world literary cultures.

ENGL 3000. Introduction to English Methods and Research.

Lec. 3. Credit 3.

Basic sources, research methodology, critical theory, and writing processes/formats needed by majors.

ENGL (PC) 3250. Professional Communication I.

Lec. 3. Credit 3.

Prerequisite: ENGL 1020. The preparation of effective technical and professional reports and the preparation and delivery of effective oral reports.

ENGL 3400. Introduction to Creative Writing.

Lec. 3. Credit 3.

Prerequisite: At least a grade of C or better in one Sophomore-level literature course (ENGL 2130, ENGL 2235, ENGL 2330) or a grade of C or better in ENGL 3810, ENGL 3820, ENGL 3910 or ENGL 3920. An introductory-level creative writing course in at least two genres: fiction, poetry, literary nonfiction, or drama. Genres to be determined by the instructor.

ENGL 3500. Mythology.-Spring. (O).

Lec. 3. Credit 3.

Greek and Roman myths in relation to modern life and literature.

ENGL 3600. The Bible as Literature.

Lec. 3. Credit 3.

This course examines the wide variety of genres and narratives that form the Bible—from the mythological and genealogical to the poetic and prophetic—and does this from critical, literary, cultural, and rhetorical perspectives.

ENGL 3810. British Literature I.

Lec. 3. Credit 3.

A survey of British authors from Old English through the eighteenth century.

ENGL 3820. British Literature II.

Lec. 3. Credit 3.

A survey of British authors from the Romantics to the present.

ENGL 3910. American Literature I.

Lec. 3. Credit 3.

A survey of American writers from the colonial period through the mid-nineteenth century.

ENGL 3920. American Literature II.

Lec. 3. Credit 3.

A survey of American writers from the mid-nineteenth century through the present.

ENGL 4111 (5111). Chaucer.-Spring. (E).

Lec. 3. Credit 3.

Selected works of Geoffrey Chaucer.

ENGL (THEA) 4121 (5121). Shakespeare.

Lec. 3. Credit 3.

Historical, thematic and other approaches in the study of Shakespeare. (May be repeated once as an elective provided the course content is different.)

ENGL 4130 (5130). Milton.

Lec. 3. Credit 3.

Selected works of John Milton.

ENGL 4140 (5140). Topics in British Literature to 1667.

Lec. 3. Credit 3.

Topics in Medieval and/or Early Modern British literature. Course may be repeated provided the content is different each time.

ENGL 4210 (5210). Eighteenth-Century British Literature.

Lec. 3. Credit 3.

Studies in eighteenth-century British literature.

ENGL 4221 (5221). Romantic Literature.

Lec. 3. Credit 3.

Studies in Romantic literature.

ENGL 4231 (5231). Victorian Literature.

Lec. 3. Credit 3.

Studies in Victorian literature.

ENGL 4240 (5240). Topics in British Literature after 1667.

Lec. 3. Credit 3.

Studies in Modern British literature. Course may be repeated provided the content is different each time.

ENGL 4250 (5250). Post Modern Literatures in English.

Lec. 3. Credit 3.

Studies in postmodern literary issues of significance in English-speaking cultures outside the United States.

ENGL 4310 (5310). Early American Literature.

Lec. 3. Credit 3.

Study of American literature from colonial period through early nationalist period.

ENGL 4320 (5321). Nineteenth Century American Literature.

Lec. 3. Credit 3.

Study of the literature and literary movements of the period, with emphasis on romanticism and/or realism.

ENGL 4330 (5330). Modern American Literature.

Lec. 3. Credit 3.

Study of the literature and literary movements of the period, with emphasis on the twentieth century and/or contemporary period.

ENGL 4340 (5340). Topics in American Literature.

Lec. 3. Credit 3.

Thematic, interdisciplinary or genre-based approaches to American literary study beyond the usual scope of ENGL 4310 (5310), ENGL 4320 (5321), or ENGL 4330 (5330). Course may be repeated provided the content is different each time.

ENGL 4411 (5411). Writing in the Professions.

Lec. 3. Credit 3.

This course builds on students' present writing competency and focuses on writing in their particular majors and/or professions.

ENGL 4421 (5421). Forms of Argumentation and Persuasion: Theory and Practice.

Lec. 3. Credit 3.

Introduces students to various models of argumentation through theory (readings) and practice (analysis and production).

ENGL 4430 (5430). Creative Writing: Fiction.

Lec. 3. Credit 3.

Prerequisite: Grade of C or better in ENGL 3400 or prior consent of the instructor. Guided practice in the craft and art of writing short fiction. Course may be repeated provided the content is different each time.

ENGL 4440 (5440). Creative Writing: Essay.

Lec. 3. Credit 3.

Prerequisite: Grade of C or better in ENGL 3400 or prior consent of the instructor. Guided practice in the craft and art of writing personal essays. Course may be repeated provided the content is different each time.

ENGL 4450 (5450). Creative Writing: Poetry.

Lec. 3. Credit 3.

Prerequisite: Grade of C or better in ENGL 3400 or prior consent of the instructor. Guided practice in the craft and art of writing poetry. Course may be repeated provided the content is different each time.

ENGL (LING) 4511 (5511). Introduction to Descriptive Linguistics.

Lec. 3. Credit 3.

Introduction to descriptive analysis of language: phonology, morphology, lexicon, and syntax.

ENGL (LING) 4521 (5521). History of the English Language.

Lec. 3. Credit 3.

History of the language from its origins to the present; emphasis upon historical development of English sounds, word structure, and syntax.

ENGL (LING) 4531 (5531). Grammar and Language.

Lec. 3. Credit 3.

Grammatical structure of English in relation to dialect and register with some emphasis on historical and potential changes in grammar.

ENGL (LING) 4541 (5541). Topics in Linguistics/Language.

Lec. 3. Credit 3.

Examination of specific aspects of language and/or linguistic study, such as Old and Middle English, the language of dialect literature or American English dialects. Course may be repeated provided the content is different each time.

ENGL 4551 (5551). Introduction to Rhetoric: Theory and Practice.

Lec. 3. Credit 3.

The course introduces students to rhetoric--history and special topics.

ENGL (LING) 4561 (5561). American English.

Lec. 3. Credit 3

This class will examine American English from multiple cultural and linguistic angles and allow the students to develop their own understanding of how the language around them shapes their lives.

ENGL 4610 (5610). Novel.

Lec. 3. Credit 3.

Theory of the novel and a study of selected novels.

ENGL 4620 (5620). Poetry: Form, Genre, Theory.

Lec. 3. Credit 3.

The study of poetry written in English and translated from other languages, with attention to such topics as poetic movements, styles, trends, the evolution, and development of forms.

ENGL 4630 (5630). Literary Criticism and Theory.

Lec. 3. Credit 3.

Historical and thematic studies of critical and theoretical trends and issues.

ENGL 4640 (5640). Modern and Contemporary Drama.

Lec. 3. Credit 3.

Study of dramatic texts and performance issues from the late 19th century to the present.

ENGL 4650. The Graphic Novel.

Lec. 3. Credit 3.

Theory of comics-format texts and study of selected graphic novels.

ENGL 4712 (5712). African American Literature.

Lec. 3. Credit 3.

Studies of African American literature and culture, both oral and printed.

ENGL 4713 (5713). Native American Literature.

Lec. 3. Credit 3.

Studies of Native American literature and culture, both oral and printed.

ENGL 4720 (5720). Continental Literature.

Lec. 3. Credit 3.

Study of major works and writers from the European continent.

ENGL 4731 (5731). Approaches to Women and Literature.

Lec. 3. Credit 3.

Studies of major women writers or images of women in literature. Course may be repeated provided the course content is different each time.

ENGL 4741 (5741). Science and Culture.

Lec. 3. Credit 3.

Cultural influences on scientific discourse and literature about science.

ENGL 4751 (5751). Topics in Non-Western Literature.

Lec. 3. Credit 3.

Focuses on literature written outside of European literary traditions, either written in or translated into English. Course may be repeated for credit as long as the topic is different.

ENGL 4810 (5810). Introduction to Folklore.

Lec. 3. Credit 3.

Generic survey of folklore; possible definitions, varieties, meanings, and methods of study. Stress on verbal traditions (tales, songs, and beliefs).

ENGL 4820. Upper Cumberland Folklore.

Lec. 3. Credit 3.

Folklore of the Upper Cumberland, with emphasis on relationships between regional material and the broad perspective of the humanities.

ENGL 4830 (5830). Southern Literature.

Lec. 3. Credit 3.

Major writers of the South, with emphasis on regional themes and on the Southern literary renaissance.

ENGL 4840 (5840). The Gothic Tale of Terror.

Lec. 3. Credit 3.

Readings in Gothic poetry and prose.

ENGL 4911 (5911). The Literature of Science.

Lec. 2. Rec. 1. Credit 3.

Topics in literary non-fiction written by scientists.

ENGL 4921 (5921). Literature and Technology.

Lec. 3. Credit 3.

Study of literature which deals with the impact of technology on society.

ENGL 4931 (5931). Literature and the Environment.

Lec. 3. Credit 3.

A study, through literature, of the relationship between humans and the environment.

ENGL (PC) 4970 (5970). Professional Communication II.

Lec. 3. Credit 3.

A continuation of ENGL 3250 with emphasis on more complex reports.

ENGL 4981 (5980). Topics.

Credit 1, 2, or 3.

Coursework or directed individual research in any area where there is no other course offering.

ENGL 4982, 4983. Topics.

Credit 1, 2, or 3.

Coursework or directed individual research in any area where there is no other course offering.

ENGL 4990 (5990). Internship.

Credit 3, 6, 9, or 12.

Prerequisite: Junior or Senior status, at least two ENGL courses at the 3000-level or above, and consent of chair or internship coordinator. Part-time or full-time employment in a business or institution setting related to a student's academic and career goals. Cannot be taken in place of required or elective English courses, undergraduate or graduate.

ENGL 4995. Senior Colloquium.

Lec. 3. Credit 3.

Prerequisite: Senior Standing as an English BA major; completion of all required ENGL 3000-level courses. Intensive study of a theme or period selected by the instructor, with an emphasis on research, writing, discussion, and presentation.

◆ Meets Tennessee Technological University general education requirement (Communication/English Composition).

English as a Second Language (ESL)

These courses are required for all students whose native language is not English, Undergraduate and Graduate, in their first two semesters at Tennessee Tech unless specifically exempted by high TOEFL and placement test results. A minimum grade of C in ESL 1010 is a prerequisite to ESL 1020. A minimum grade of C in ESL 1020 is a prerequisite to ENGL 1010. ESL 1010 and ESL 1020 do not satisfy the ENGL 1010 and ENGL 1020 communication requirement of the General Education core, nor do these courses count toward any degree requirements.

ESL 1010. English as a Second Language.

Lec. 3. Credit 3.

English for non-native speakers with emphasis on pronunciation, idioms, syntax, and vocabulary. Additional

work in the language laboratory at the discretion of the instructor.

ESL 1020. English as a Second Language.

Lec. 3. Credit 3.

English for non-native speakers with emphasis on pronunciation, idioms, syntax, and vocabulary. Additional work in the language laboratory at the discretion of the instructor.

English as a Second Language Pedagogy (ESLP)

ESLP 4100 (5100). ESL Methodology and Materials for PreK-12.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Current approaches, methodologies, techniques, and materials for teaching ESL primarily in preK-12 situations; developing literacy skills appropriate for age and language proficiency levels.

ESLP 4200 (5200). ESL Assessment: Reading and Writing.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program, ESLP 4100 (5100) and LING 4511 (5511). Assessing proficiency for ESL placement and eventual integration into school curriculum (mainstreaming) with special emphasis on language literacy skills: reading and writing.

ESLP 4300 (5300). Field Experience in ESL.

Credit 3.

Prerequisite: Full admission to the Teacher Education Program; ESLP 4100 (5100) or consent of instructor. Teaching ESL in preK-12 under supervision of experienced ESL staff: writing objectives, planning lessons, materials evaluation, testing.

Entrepreneurship (ENTR)

Enrollment in Junior- or Senior-level ENTR courses requires Junior Standing. All business majors must have completed the Basic Business Program.

ENTR 1810. Governor's School for Information Technology Leadership.

Lec. 3. Credit 3.

Prerequisite: Enrollment is restricted to Governor's School for IT Leadership participants. The course will introduce students to the principles, problems, and practices in business leadership. The focus of the class will be on the students developing a business plan for an information technology based company.

ENTR (MKT) 3200. Entrepreneurial Mindset.

Lec. 3. Credit 3.

This introductory course provides a framework of entrepreneurial thinking and acting. Specifically, this

course aims to help students become more customer-oriented and opportunity-driven in acting on innovative ideas, serve as change agent, and learn leveraging resources while mitigating and managing risks. It further provides a basic infrastructure in business, so students can accomplish the eventual transition of successfully managing, financing and marketing the business venture and products/services in increasingly competitive global market places/spaces.

ENTR 4500. Innovation and Entrepreneurship: Lean Launchpad.

Lec. 3. Credit 3.

Lean Launchpad focuses on innovating and evolving a product or service into a viable business model. The curriculum is structured around the Lean Launchpad program where student teams organize and develop their "business canvas."

ENTR 4900. Special Topics in Entrepreneurship.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Current topics in Entrepreneurship. All business majors must have completed the Basic Business Program.

Environmental and Sustainability Studies (ESS)

ESS 1020. Connections to Environmental and Sustainability Studies.

Lec. 1. Rec. 2. Credit 1.

The course is designed to strengthen the student's connection to TTU by engaging the student in meaningful academic and nonacademic activities both in and out of the classroom. It emphasizes critical thinking in the formation of academic and social goals and support groups, and in self-management and development of study skills.

ESS 1100. Introduction to Environmental Studies.

Lec. 3. Credit 3.

This course is an introductory course to the field of environmental studies. Environmental problems are complex, involving interconnections between people, ecosystems and the biosphere. The solution to these problems requires an understanding of diverse areas of study, including chemistry, biology, ecology, toxicology, hydrology, psychology, sociology, anthropology, economics, ethics, history, law, politics, literature and communication.

ESS 1200. Environmental Research I.

Lec. 1. Lab 4. Credit 3

An introductory practical course on research methods in the environmental sciences and allied fields. Students will be paired with a research mentor and will actively participate in an undergraduate research project.

ESS 2200. Environmental Research II.

Lec. 1. Lab 4. Credit 3.

Prerequisite: ESS 1200; or previous research experience plus consent of instructor. An intermediate-level course on conducting research in the environmental sciences and allied fields. Students will be paired with a research mentor and will conduct an undergraduate research project, which may be a new project or a continuation of a research project initiated in ESS 1200; however, students will be more involved in the research design and implementation than in ESS 1200.

ESS 2300. Environmental Science Communication.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: ESS 1200 or ESS 2200; or previous research experience plus consent of instructor. A course on developing oral and written scientific communication skills necessary to convey research findings in a variety of formats used by professionals in the environmental sciences and allied fields. Students will learn basic principles of scientific writing and the process of developing oral and poster presentations for conferences, and manuscripts for scientific journals.

ESS 3000. Introduction to Environmental Law.

Lec. 3. Credit 3.

Prerequisite: Junior Standing or consent of instructor. The course presents the basics of environmental laws from local governments to international agreements emphasizing U.S. laws and the roles of federal and state agencies in our domestic legal. The interaction of law with policy formulation, implementation and enforcement, and opportunities for citizen involvement are reviewed.

ESS 3710. Chemistry and the Environment.

Lec. 3. Credit 3.

Prerequisite: CHEM 1010. Concepts of environmental chemistry that include organic chemistry, polymer chemistry, the chemistry of the earth, water and air, biochemistry, and energy. A grade in ESS 3710 may be accepted as a replacement for a previous grade in CHEM 3710.

ESS 4001. Society and the Environment: Capstone Experience Part 1.

Lec. 3. Credit 3.

Prerequisite: Senior Standing. The course is the first semester of a two semester sequence that will be a case study to learn about the environmental issues and possible solutions. The first semester course will address interdisciplinary approaches to environmental issues, research methods and grantsmanship.

ESS 4002. Society and the Environment: Capstone Experience Part 2.

Lec. 3. Credit 3.

Prerequisite: ESS 4001. The course topic will focus on a specific environmental issue facing society. The course will be conducted as a case study to learn about the environmental issues and possible solutions.

ESS 4091, 4092, 4093. Special Topics.

Credit 1-3.

Prerequisite: Consent of instructor and school director. Upper division level study in a specific topic related to Environmental & Sustainability Studies. Course may be repeated if topic is different. No more than a combined total of 9 hours of ESS 4091, 4092, and 4093 may be used for degree.

ESS 4200. Advanced Environmental Research.

Lec. 1. Lab. 4. Credit 3.

Prerequisites: ESS 2200 and ESS 2300; or previous research experience and consent of instructor. Pre- or Co-requisite: MATH 3070 or upper-division statistics course (e.g., AGBE 4210, BIOL 4220). An advanced course on conducting research in the environmental sciences and allied fields. Students will work with a research mentor as in ESS 1200 and ESS 2200, but the student will have a more prominent and independent role in experimental design, data analysis, scientific writing, and communicating research findings at a conference or by submitting a manuscript for publication.

ESS 4300. Environmental Management System.

Lec. 3. Credit 3.

The course is a case study that presents the student with the techniques, technologies, regulations and strategies that define industrial pollution prevention.

ESS 4900. Internship.

Credit 3.

Prerequisite: At least 9 hours in ESS coursework and Junior Standing. Students are placed in a public or private agency or organization which is compatible with their interests in environmental and sustainability studies.

Exercise Science, Physical Education and Wellness (EXPW)**EXPW 1021. Connection to Exercise Science, Physical Education, and Wellness.**

Lec. 1. Credit 1.

This course is designed to give the student an overview of the University as well as introduce the various career paths that are possible with a degree in Exercise Science. The goal for this class is to help students to connect with one another, the EXPW family, campus, and community.

EXPW 1022. Introduction to Exercise Science, Physical Education, and Wellness.

Lec. 2. Credit 2.

This course is designed to provide students with relevant information about the Exercise Science Department and educational opportunities within as well as historical background, general scope, occupational opportunities, and principles and objectives of exercise science, and related fields/occupations.

EXPW 1110. Introduction to Athletic Training.

Lec. 1. Credit 1.

This course will define and explore the profession of Athletic Training. Critical tasks, domains, essential competencies, and associated knowledge that Athletic Trainers should possess to perform the required functions satisfactorily will be identified and explored. The various job settings, career paths, and educational requirements of Athletic Trainers will be investigated. Areas to be covered include: the history of Athletic Training, the role of the Athletic Trainer in Sports Medicine, athletic training facility organization, blood borne pathogens and OSHA, administrative concepts, legislative and legal concerns, basic medical terminology, and record keeping.

EXPW 1150. Care and Prevention of Athletic Injuries.

Lec. 3. Credit 3.

This course introduces basic knowledge of the prevention, recognition, management, and rehabilitation of common athletic injuries. Topics will include sports nutrition, protective equipment, handling emergency situations, injury assessment, basic injury rehabilitation, and recognizing various types of sports injuries. In addition, students will learn basic wrapping and taping techniques.

EXPW 2001. Orthopedic Assessment I.

Lec. 3. Clinical 1. Credit 4.

Prerequisite: Sophomore standing. Corequisite: BIOL 2010. This course is designed for advanced study of the etiology, pathology, and clinical signs and symptoms of common injuries to the lower extremities and lumbar spine. Students will learn the elements of the evaluation, assessment, management, and rehabilitation of common athletic injuries in the lower extremities and lumbar spine region. Emphasis is placed on clinical evaluation of injuries by the Athletic Trainer. Students will have opportunities for demonstration and hands-on experience related to skills learned in the classroom. Clinical experiences are designed to evaluate specific clinical competencies introduced in this course. Students will participate in clinical instruction and must demonstrate proficiency in the clinical competencies. Students must work in the field with a Certified

Athletic Trainer in the 30 hour supervised clinical/field experience. Students with the Pre-Athletic Training concentration must pass this class with a "B" or better to continue in the program.

EXPW 2002. Orthopedic Assessment II.

Lec. 3. Clinical 1. Credit 4.

Prerequisite: Sophomore standing, EXPW 2001 and BIOL 2010. Corequisite: BIOL 2020. This course is designed for advanced study of the etiology, pathology, and clinical signs and symptoms of common injuries to the upper extremities, cervical and thoracic spine, and abdomen. Students will learn the elements of the evaluation, assessment, management, and rehabilitation of common athletic injuries in these anatomical regions. Emphasis is placed on clinical evaluation of injuries by the Athletic Trainer. Students will have opportunities for demonstration and hands-on experiences directly related to the skills learned in the classroom. Clinical experiences are designed to evaluate specific clinical competencies introduced in the classroom. Students will participate in clinical instruction and must demonstrate proficiency in the clinical competencies. Students must work in the field with a Certified Athletic Trainer in the 30 hour supervised clinical/field experience. Students with the Pre-Athletic Training concentration must pass this class with a "B" or better to continue in the program.

◆EXPW (HEC) 2015. Concepts of Health and Wellness.

Lec. 3. Credit 3.

Exploration of the impact of health and wellness as it affects personal behavior, social development, and quality of life for individuals, families and communities. Analysis of behavioral change theories regarding social context of individual human behavior and examination of current social and behavioral science research within the context of health and wellness.

EXPW 2100. Life Guard Training.

Credit 2.

This course is designed to prepare students to perform the duties and responsibilities of a life guard of swimming pools and at protected open water non-surf beaches. Satisfactory completion can lead to lifeguard certification.

EXPW 2130. Concepts of Comprehensive Health.

Lec. 3. Credit 3.

This course is designed to provide current information related to all areas of personal health to the student. This is typically a survey of the areas and aspects of health and wellness.

EXPW 2150. Human Sexuality.

Lec. 3. Credit 3.

This course is a survey of the dynamics of human sexuality as well as an identification and examination of basic issues in human sexuality as relating to the larger

society. Topics include: current/historical issues, attitudes, and perspectives towards sexuality; anatomy and physiology of male and female reproductive systems; human sexual response cycle; conception/childbirth; contraception; sexually transmitted infections; sex and the law; sexual expression and variation; and typical and atypical sexual behaviors.

EXPW 2160. Drug Use and Abuse.

Lec. 2. Credit 2.

The study of legal and illegal drugs and their relationship to contemporary society.

EXPW 2170. Introduction to Sport Management.

Lec. 3. Credit 3.

This course is an overview of the fundamental principles of management and administration of sport programs. The combination of theory and practice related to legal and ethical issues, marketing, and organizational structure of sport-related services and facilities is covered.

EXPW 2430. First Aid, Safety and CPR.

Lec. 1. Lab. 2. Credit 2.

This course consists of practice and application of the most current standards and accepted principles of CPR, safety and first aid. Students have opportunity to obtain certification through the American Red Cross.

EXPW 2440. Safety and Accident Prevention.

Lec. 2. Credit 2.

Safety problems in the home, school, public places, highways and the specific problems of industry along with an emphasis on proper attitudes toward safe driving and safety in general.

EXPW 3001. Therapeutic Rehabilitation and Modalities I.

Lec. 3. Credit 3.

Prerequisite: EXPW 2001, EXPW 2002. Corequisite: EXPW 3011. This course explores the principles in planning and implementation of rehabilitation programs for injured athletes. Emphasis is placed on development of comprehensive, individualized rehabilitation protocols using a combination of therapeutic modalities and exercises. Specifically, students will plan and implement sport-specific functional rehabilitation programs based on predetermined therapeutic goals and objectives. Students will have opportunities for demonstration and hands-on learning of the skills learned in the classroom.

EXPW 3006. Medical Aspects of Athletic Training.

Lec. 3. Credit 3.

Prerequisite: EXPW 3001, HEC 2220. This course includes the advanced study in Athletic Training of general medical conditions and disabilities, head and facial injuries, and internal injuries in the athlete. Students will use skills developed in previous courses to

perform general medical examinations within the scope of Athletic Training practice and examine the etiology of illnesses and diseases present in athletic populations.

EXPW 3011. Clinical I.

Clinical 3. Credit 3.

Corequisite: EXPW 3001. This clinical experience is designed to provide opportunities for students to evaluate specific clinical competencies introduced in the previous Athletic Training classes. Students will receive clinical instruction and must demonstrate proficiency in the clinical competencies. This course provides an opportunity for the athletic training student to practice and observe athletic training skills in a clinical setting. Students will assist a Certified Athletic Trainers with various sports and teams in the area as well as observe in a Physical Therapy clinic. Students are required to complete a minimum of 120 clinical hours under the direct supervision of an accredited preceptor.

EXPW 3012. Educational Gymnastics, Dance and Fitness.

Lec. 1. Credit 1.

This course provides experiences for the candidate to become familiar with educational gymnastics, dance and fitness and how to teach each of these in elementary, middle and high school settings.

EXPW 3032. Exercise Prescription for Fitness and Wellness.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior standing in EXPW. The purpose of this course is to assist students with exercise testing decision-making and techniques as well as to determine appropriate exercise programming for desired fitness goals. Students will learn field and lab assessments of health-related physical fitness and design exercise programs to target specific outcomes in various populations.

EXPW 3050. Water Safety Instructor's Course.

Credit 2.

Instruction in senior lifesaving; parts one and two of the instructor's training course in water safety.

EXPW 3070. Lifetime Wellness and Leisure Activities.

Lec. 2. Lab. 2. Credit 3.

This course is designed to help students identify and develop skills needed to be safe and successful in lifetime wellness and leisure activities. The goal is for students to find activities that they enjoy that will lead to a lifetime of personal physical fitness.

EXPW 3091. Coaching Individual Sports.

Lec. 2. Lab. 1. Credit 3.

Prerequisite or Corequisite: EXPW 3180. This course is a study of philosophies, skills, knowledge, strategies and

leadership associated with coaching selected individual sports.

EXPW 3092. Coaching Team Sports.

Lec. 3. Credit 3.

Prerequisite: EXPW 3180. This course is designed to examine the theory and practice of coaching volleyball, basketball, baseball/softball and soccer.

EXPW 3132. School Health Pedagogy and Practicum.

Lec. 2. Lab. 1. Credit 3.

Prerequisite: EXPW 2130, or EXPW 2015 and Physical Education licensure major. This course is designed to provide the student multiple opportunities to examine Health or Lifetime Wellness curriculum design, gain familiarity with instructional methodology and design as well as participate in supervised practicum. experience in the secondary health or lifetime wellness classroom. Students develop lesson plans according to the State of Tennessee standards for Lifetime Wellness using the EdTPA lesson plan model. Lesson/learning assessment is also included as a core component of this course.

EXPW 3170. Motor Learning. Lec. 3. Credit 3.

This course is designed so that students can learn about the process of improving motor skills through practice, with long-lasting changes in the capability for responding. Through work in the classroom and lab-like experiences the processes and principles of motor learning will be examined.

EXPW 3180. Introduction to Coaching.

Lec. 3. Credit 3.

This course provides candidates with an exposure to the application of theoretical aspects of coaching including philosophy, teaching, training, management, ethics, gender and culture.

EXPW 3300. Sports Officiating. Lec. 2. Credit 2.

Detailed techniques and methods of sports officiating involving rule interpretation and ethical character.

EXPW 3301. Sports Officiating: Spring Sports.

Lec. 2. Credit 2.

This course is intended to teach the student the knowledge of the rules, duties, responsibilities, signals, positioning, and philosophy of a sports official through classroom and practical officiating experience for the sports of tennis, baseball, and softball. This class will require 15 hours of practical "lab" experience outside of the classroom and in addition to the lectures. Lecture length will be adjusted to accommodate for outside class requirements.

EXPW 3410. Lifespan Motor Development.

Lec. 3. Credit 3.

This course is an introduction to the developmental

aspects of human motor behavior across the life span, essentially observing movement from birth and throughout life, identifying how and why movement happens the way it does and why movement changes throughout life. The main focus is on characteristics of the stages of motor development as well as issues related to the physical growth, and development.

EXPW 3560. Techniques and Tactics of Sports.

Lec. 1. Lab. 2. Credit 2.

This course is designed to explore a variety of sports. Students will examine including required skills required for game play, rules of play, offensive and defensive strategies and more. Participation in a variety of sports is required.

EXPW 3660. Curriculum in Physical Education.

Lec. 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. This course examines various curriculum models in physical education and prepares teacher candidates to construct and evaluate curricula in physical education.

EXPW 3720. Instructional Strategies.

Lec. 3. Credit 3.

This course is designed for students who plan to teach physical education to identify specific strategies that will be beneficial while teaching in the physical education classroom. The philosophy of teaching physical education, models of instruction and administration of physical education programs, and methods of planning and managing physical education classes is included.

EXPW 4001. Senior Seminar. Lec. 3. Credit 3.

Prerequisite: Senior Standing, EXPW 4730. This class is designed for students to develop skills and knowledge base that will aid the student while conducting and critically reviewing research in Athletic Training. Students will prepare and present a research project on a topic approved by the instructor. In addition, this course will provide the student the opportunity to explore and evaluate CAATE accredited Athletic Training programs and prepare students for the application and selection process.

EXPW 4011. Clinical II. Clinical 3. Credit 3.

Clinical experiences are designed to evaluate specific clinical competencies introduced in the previous Athletic Training classes. This course provides opportunities for the athletic training student to practice and observe athletic training skills in a clinical setting. Students must demonstrate proficiency in advanced clinical competencies and are expected to perform the skills learned in the previous semesters. Students are required to seek out and secure individual placement in a clinical

setting such as university or high school athletic training room, physical therapy clinic, urgent care, emergency care, etc. Students must complete a minimum of 120 clinical hours under the supervision of an approved preceptor and placement must be approved by the instructor.

EXPW 4032. Training for Performance.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior Standing. The purpose of this course is to expose students to theory that dictates physical training for sport performance as well as the practical application of physical training and evaluation. Students will participate in various in-class evaluation, practical training, and prescription activities. The course will also serve as a beginning preparatory course for the NSCA CSCS examination.

EXPW 4042. Health Promotion. Lec. 3. Credit 3.

This course is an evaluation of various physical activity behavior change models, assessment of health promotion programs and evaluation standards. Topics include: health status; historical and current issues in health promotion; philosophical foundations of health promotion; intrapersonal health behavior change theories; CHES; work settings for health educators; and ethics in health promotion.

EXPW 4171. Exercise and Sport Psychology.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior Standing in EXPW and PSY 1030 or permission of instructor. This course is designed to provide an introduction to the field of exercise and sport psychology, history, theory, and psychological techniques that hinder or enhance exercise, rehabilitation and sport performance. Students should be able to understand psychological techniques that help or hinder their own performance in sport, exercise and other areas, i.e., academics, career, etc.

EXPW 4210. Gerontology. Lec. 3. Credit 3.

Prerequisite: Junior or Senior Standing. The course is designed to provide an introduction to new ways of thinking about aging. The content will center on the social, psychological and physical dimensions of aging. The material will examine the aging process experienced by older individuals explore the aging population and the effects on society as a whole.

EXPW 4290. Accident Prevention. Credit 2.

Emphasis on proper attitudes toward safe driving and safety in general.

EXPW 4300. Basic Driver and Traffic Safety Education.

Credit 2.

Actual experiences in simulation and behind-the-wheel driver education.

EXPW 4310. Advanced Driver and Traffic Safety Education.

Credit 2.

Current materials and administration of simulation and behind the wheel driver education programs.

EXPW 4420. Kinesiology. Lec. 3. Credit 3.

Prerequisite: BIOL 2010 or BIOL 2350. This course is the A advanced study of the anatomy of the muscular, skeletal and articular systems, and basic biomechanics and applications related to athletic training and performance of athletes.

EXPW 4440. Physiology of Exercise.

Lec. 3. Credit 3.

Prerequisite: BIOL 2350 or BIOL 2010. During this class, students will examine the physiological effects of exercise, sports, and other stresses on the various systems of the human body. Application of principles to physical fitness, physical education, and athletics is included.

EXPW 4442. Advanced Exercise Physiology.

Lec. 3. Credit 3.

Prerequisite: EXPW 4440 with grade of B or better. This course is the study of the immediate and long-term effects of physical activity on the acute and chronic effects of physical activity on body systems with regard to the neuromuscular, energy, respiratory and cardiovascular systems with reference to exercise evaluation and prescription.

EXPW 4520. Adapted Physical Activity and Sport.

Lec. 2. Lab. 2. Credit 3.

The purpose of this course is to guide students in developing knowledge of current trends and concepts in adapted physical education and sport as well as examining various services, programs and requirements for individuals with disabilities. By the end of the course students should display acceptable levels of confidence in screening children who may need adapted physical education/activity as well as working with and evaluating special needs children. Design and implementation of adapted physical activity & sport programs to meet unique needs of individuals will also be required.

EXPW 4530. Organization and Administration of Interschool Athletics.

Lec. 3. Credit 3.

This course is a study of issues faced by administrators, principals, athletic directors and coaches.

EXPW 4540. Ethical Issues in Sport.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior Standing. This course is designed to assist students in self-evaluating, examining, and developing a philosophy, values, and moral reasoning skills. Major moral/ethical issues within sports will be researched and discussed. Students will experience the ethical decision-making process through opportunities for critical analysis drawing upon their philosophical values.

EXPW 4550. Sport Governance. Lec. 3. Credit 3.

Prerequisite: Junior or Senior Standing. This course is designed for students interested in the growing problems of sports litigation. Amateur and professional aspects of sports are covered from four major perspectives: (1) judicial review of athletic associations; (2) eligibility rules and disciplinary measures; (3) equal opportunity provisions; and (4) tort liabilities. Specific topics include due process, anti-trust, and free speech, coed competition, duty of ordinary care, and of care owed athletes and spectators, injuries, assumption of risk, and contributory negligence. The course stresses the application of principles of law to the sports setting. Actual court cases relating to these principles are examined.

EXPW 4560. Facility Planning and Management.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior Standing. This course is an overview of all elements involved in sport event management. One key component of the course includes planning, organizing, marketing, and conducting a mock event during the semester.

EXPW 4711. Analysis and Development of Sport Skills.

Lec. 2. Lab. 2. Credit 4.

Prerequisite: Physical Education licensure major and acceptance into Teacher Education. This course includes multiple opportunities for candidates to examine and develop instructional methods related to planning, teaching and analyzing skills appropriate for secondary physical education. Candidates will prepare and teach multiple lessons using the State of Tennessee standards for physical education in grades 6-8 or 9-12. The EdTPA lesson plan template and assessment process is utilized during this course. Practicum hours are required for the completion of this course. A grade of "B" or better is required to progress to Residency.

EXPW 4721. Methods of Elementary Movement.

Lec. 2. Lab. 2. Credit 4.

Prerequisite: Physical Education licensure major and acceptance into Teacher Education. This course includes multiple opportunities and experiences for the physical education candidate to obtain relevant

knowledge about teaching physical education that is elementary school specific. Various instructional methods for teaching motor skills and movement concepts, including rhythms and gymnastics are covered. Candidates will prepare and teach multiple lessons using the State of Tennessee standards for physical education in grades K-2 or 3-5. The EdTPA lesson plan template and assessment process is utilized during this course. Practicum hours are required for the completion of this course. A grade of "B" or better is required to progress to Residency.

EXPW 4730. Assessment and Evaluation in Exercise Science.

Lec. 3. Credit 3.

The purpose of this course is to direct students to select/construct, administer, score, and evaluate tests specific to human performance. Students will be exposed to standardized tests and will explore the uses and development of authentic tests. Each class period consists of lecture and administration of assessments.

EXPW 4731. Assessment in the Physical Education Classroom.

Lec 2. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. This course provides teacher candidates with multiple opportunities to construct and administer various assessment measures and to interpret data from assessing student performance and learning in physical education. The EdTPA assessment tool – TASK 3 is examined. Use of rubrics, administering standardized fitness tests, administering various skills tests and analyzing the results is included.

EXPW 4760. Functional Movement.

Lec. 3. Credit 3.

Prerequisite: EXPW 3032 with a grade of B or better. This course is designed to provide understanding of the importance of functional movements in life. Functional movements mimic motor recruitment patterns that are found in everyday life. Students will learn that functional movements are mechanically sound, can help alleviate injury, and elicit a high neuroendocrine response.

EXPW 4810. Field Experience. Lab. 1-4. Credit 1-4.

Prerequisite: Successful completion of course requirements in the core requirements. Three to nine hours of credit may be earned. This course may be taken independent of course work as a culminating experience for three hours credit. Participation in on-the-job experiences will be provided in a wide range of hosting agencies, institutions, and clinics. Requirements for course completion will vary depending on the number of credit hours to be earned.

EXPW 4820. Field Experience.

Lab. 1-4. Credit 1-4.

Prerequisite: Successful completion of course requirements in the core requirements. Three to nine hours of credit may be earned. This course may be taken independent of course work as a culminating experience for three hours credit. Participation in on-the-job experiences will be provided in a wide range of hosting agencies, institutions, and clinics. Requirements for course completion will vary depending on the number of credit hours to be earned.

EXPW 4830. Field Experience.

Lab. 1-4. Credit 1-4.

Prerequisite: Successful completion of course requirements in the core requirements. Three to nine hours of credit may be earned. This course may be taken independent of course work as a culminating experience for three hours credit. Participation in on-the-job experiences will be provided in a wide range of hosting agencies, institutions, and clinics. Requirements for course completion will vary depending on the number of credit hours to be earned.

EXPW 4871. Residency I.-Fall.

Credit 5.

Prerequisite: Physical Education licensure major, acceptance into Teacher Education and completion of EXPW 4711 and EXPW 4721 with a grade of B or higher. Corequisite: EXPW 4873. This course is a supervised authentic teaching experience. Candidates are assigned placement in a school where they spend 12 hours per week for the duration of the semester job shadowing, preparing and teaching. There are multiple evaluations by a university supervisor during this residency experience. Individual guidance and assistance is given to each candidate during Residency I in preparation for success in Residency II. A grade of B is required to meet degree requirements.

EXPW 4873. Professional Seminar I.—Fall.

Lec. 3. Credit 3.

Prerequisites: Full Admission to the Teacher Education; completion of EXPW 4711 and EXPW 4721 with a grade of B or better. Corequisite EXPW 4871. This seminar is a problem-based learning experience that is directly linked to individual candidate's experiences in EXPW 4871 – Residency I and potential teaching situations. Special attention is given to Ready 2 Teach and EdTPA.

EXPW 4881. Residency II.-Spring.

Credit 10.

Prerequisite: Physical education licensure major, acceptance into Upper Division Teacher Education and completion of EXPW 4871 and EXPW 4873 with a grade of B or higher. Corequisite: EXPW 4882. This is the final semester of Residency which is a full-time, supervised

teaching experience where the candidate teaches physical education at either the elementary, middle or high school level. The candidate must complete and submit the EdTPA assessment during this course, and score minimum or higher for program completion, graduation and gaining a Tennessee teaching license. For cut scores and timelines see Office of Teacher Education.

EXPW 4882. Professional Seminar II.-Spring.

Credit 2.

Corequisite: EXPW 4881. This course is a seminar on issues related to the interrelationships among school, culture and society; a historical, philosophical and sociological analysis.

EXPW 4900. Research Methods in Exercise Science.

Lec. 3. Credit 3.

Prerequisite: Senior Standing and completion of EXPW 4730. This undergraduate course provides a comprehensive introduction to research proposal writing, research methodologies, and foundational research theories and protocols. Students in this course learn about the cyclical nature of applied research and the process of research writing.

◆ **Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).**

Finance (FIN)

Enrollment in Junior- and Senior-level FIN courses requires Junior Standing. All business majors must have completed the Basic Business Program.

FIN 2000. Personal Finance.

Lec. 3. Credit 3.

Financial concepts and practices relevant to personal financial decision making. This course may be used as a business elective, but not as a Finance elective.

FIN 3210. Principles of Managerial Finance.

Lec. 3. Credit 3.

Prerequisite: ECON 2010, ECON 2020, and ACCT 2120 (or ACCT 3720 for non-business majors only). Financial theory and procedures required for the financial decision-making function of business organizations.

FIN 3220. Intermediate Financial Management.

Lec. 3. Credit 3.

Prerequisite: FIN 3210. Leasing, dividend policy, capital structure, long-term financing, convertibles, and warrants.

FIN 3410. Principles of Real Estate.

Lec. 3. Credit 3.

Basic concepts, procedures, and analysis of real estate, property rights and liabilities, real estate instruments, estates, and liens.

FIN 3610. Risk Management and Insurance.

Lec. 3. Credit 3.

Fundamentals underlying the insurance method of handling risk, including the cost and functions of insurance contracts related to business and personal decision-making.

FIN 3830. Fundamentals of Investment.

Lec. 3. Credit 3.

Prerequisite: ECON 3610, FIN 3210 or consent of instructor. Investment alternatives, markets and techniques of security valuation and analysis with emphasis on stock markets.

FIN 4230. Advanced Financial Decision Analysis.

Lec. 3. Credit 3.

Prerequisite: FIN 3220, ECON 3610 and FIN 3830. Cash-flow analysis, budgeting, NPV, financial ratio analysis, financial planning, and use of microcomputers in finance.

FIN 4430. Real Estate Finance and Appraisal.

Lec. 3. Credit 3.

Prerequisite: FIN 3210. Principles of financing real estate transactions, including valuation, sources of funds, cost of financing, and real estate appraisal.

FIN 4460. Investment Analysis and Portfolio Management.

Lec. 3. Credit 3.

Prerequisite: FIN 3830. A study of the impact of economic factors and security markets upon security and portfolio values. Geared toward students wishing to pursue a career in financial markets.

FIN 4470. Investment Challenge I.

Lec. 3. Credit 3.

Prerequisite: FIN 3830 and permission of instructor. Advanced portfolio theory through actual management of a real investment portfolio.

FIN 4480. Investment Challenge II.

Lec. 3. Credit 3.

Prerequisite: FIN 3830 and permission of instructor. Advanced portfolio theory through actual management of a real investment portfolio.

FIN (ECON) 4510 (5510). International Trade and Finance.

Lec. 3. Credit 3.

Prerequisite: ECON 3320. International trade and monetary exchange, balance of payments and foreign investments.

FIN 4900. Commercial Banking. Lec. 3. Credit 3.

Prerequisite: ECON 3320. Bank operations, including policy making and management of assets, liabilities and capital.

FIN 4910. Multinational Financial Management.

Lec. 3. Credit 3.

Prerequisite: FIN 3210. International markets and instruments, global financing strategies, global capital budgeting, global working capital management, and international tax planning.

FIN 4930. Integrative Case Studies in Finance.

Lec. 3. Credit 3.

Prerequisite: FIN 3220. Case studies simulating the role of the modern financial manager in financial decision making.

FIN 4990. Special Topics.

Credit 3-6.

Prerequisite: Consent of departmental chairperson. Directed study and research on a selected topic in finance.

FIN 5020. Basic Finance.

Lec. 3. Credit 3.

Prerequisite or corequisite: ACCT 5010. Introduction to the concepts and procedures needed for basic financial decision making in a corporate environment. Includes problem solving using spreadsheet templates.

Foreign Languages and Cultural Studies (FLCS)**FLCS 1010. Foreign Languages and Cultural Studies I.**

Cross-listed with: FREN 1010 Elementary French I, GERM 1010 Elementary German I, SPAN 1010 Elementary Spanish I.

FLCS 1020. Foreign Languages and Cultural Studies II.

Cross-listed with: FREN 1020 Elementary French II, GERM 1020 Elementary German II, SPAN 1020 Elementary Spanish II.

FLCS 2010. Foreign Languages and Cultural Studies III.

Cross-listed with: FREN 2010 Transition to Intermediate French, GERM 2010 Transition to Intermediate German, SPAN 2010 Transition to Intermediate Spanish.

FLCS 2020. Foreign Languages and Cultural Studies IV.

Cross-listed with: FREN 2020 Intermediate French, GERM 2020 Intermediate German, SPAN 2020 Intermediate Spanish.

FLCS 3000. Global Studies.

Lec. 3. Credit 3.

Prerequisite: Junior Standing. Global topics will be

examined from the perspective of current research in Germanic, Hispanic, and Francophone Studies, and from a variety of other disciplines, highlighting connections between the larger class topic, the international community, and the local community. Topics will change.

Foreign Language Studies (FLST)

FLST 1011. Elementary Foreign Language Study I.

Credit 1-3.

Prerequisite: FLST 1013 or equivalent is prerequisite to FLST 1021. Essentials of the language, developing listening and reading comprehension, oral and written communication, and cultural understanding. Course may be repeated if the language is different.

FLST 1013. Elementary Foreign Language Study I.

Credit 1-3.

Prerequisite: FLST 1013 or equivalent is prerequisite to FLST 1021. Essentials of the language, developing listening and reading comprehension, oral and written communication, and cultural understanding. Course may be repeated if the language is different.

FLST 1021. Elementary Foreign Language Study I.

Credit 1-3.

Prerequisite: FLST 1013 or equivalent is prerequisite to 1021. Essentials of the language, developing listening and reading comprehension, oral and written communication, and cultural understanding. Course may be repeated if the language is different.

FLST 1023. Elementary Foreign Language Study I.

Credit 1-3.

Prerequisite: FLST 1013 or equivalent is prerequisite to FLST 1021. Essentials of the language, developing listening and reading comprehension, oral and written communication, and cultural understanding. Course may be repeated if the language is different.

◆FLST 2520 (3520). The Cultures and Peoples of North Africa.

Lec. 3. Credit 3

This course is an introduction to the culture, politics, geography, diversity, arts, social structures, and history of selected nations of North Africa. Credit will not be given for both FLST 2520 and FLST 3520.

◆ Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).

Foreign Languages – French (FREN)

FREN 1010. Elementary French I.

Lec. 3. Credit 3.

Essentials of French, developing listening and reading

comprehension, oral and written communication, and cultural understanding.

FREN 1020. Elementary French II.

Lec. 3. Credit 3.

Prerequisite: FREN 1010. Essentials of French, developing listening and reading comprehension, oral and written communication, and cultural understanding. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

FREN 2010. Transition to Intermediate French.

Lec. 3. Credit 3.

Prerequisite: FREN 1020. Continuation of the essentials of French, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010-1020. Review as necessary. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

FREN 2020. Intermediate French.

Lec. 3. Credit 3.

Prerequisite: FREN 2010. Expansion of French language study, building on the fundamentals of French acquired in 1010, 1020, and 2010. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

◆FREN 2510. French Culture and Civilization.

Lec. 3. Credit 3.

No background in French required. This course is taught in English. Introduction to French cultural and intellectual history, geography and diversity, arts and the political and social structures and characteristics of France today. Credit will not be given for both FREN 2510 and FREN 3510.

FREN 3010. Written Communication in French.

Lec. 3. Credit 3.

Prerequisite: FREN 2020. Writing with additional practice in listening, speaking and reading, while exploring cultural topics. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3020. Oral Communication in French.

Lec. 3. Credit 3.

Prerequisite: FREN 2020. Oral communication (speaking and listening) with additional practice in writing and reading while exploring cultural topics. Required for majors. Students with native-like fluency in French will substitute a different upper-level course for this one. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3100. French Phonetics. Lec. 3. Credit 3.
Prerequisite: FREN 3010. Detailed analysis of the significant features of the French sound system, intonation patterns, and graphic representations of phonemes. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3110. Survey of French Literature I. Lec. 3. Credit 3.
Prerequisite: FREN 3010. Literature of France from its earliest development to the present day. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3112. Culture and Civilization of France. Lec. 3. Credit 3.
Prerequisite: FREN 3010. A study of important aspects of French civilization and culture from its beginning to present day. Required for French majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3120. Survey of French Literature II. Lec. 3. Credit 3.
Prerequisite: FREN 3010. Literature of France from the nineteenth century through present day. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3200. Business French. Lec. 3. Credit 3.
Prerequisite: FREN 3010. Business vocabulary, readings, and conversations in French on various business topics and on culture as it affects business interactions and practices in social and formal situations. Required for majors in International Business and Cultures who have a concentration in French. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3510. France: The Country & the People. Lec. 3. Credit 3.
No background in French required. Introduction in English to the history, arts, geography, and government of France and to the social characteristics of the French people.

FREN 4810 (5810). Special Topics in French. Lec. 3. Credit 3.
Prerequisite: FREN 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 4910. Directed Studies in French.
Read. 1-6. Credit 1-6 per semester. Maximum 16.
Prerequisite: FREN 3010 or equivalent or consent of instructor. Concentrated readings in areas of special interest. Available to French majors on an individual basis, with consent of departmental chairperson.

FREN 4920. Senior Capstone. Ind. 3. Credit 3.
Prerequisite: Consent of the Chair of the Foreign Language Department. Senior Standing required, normally taken during the last semester before graduation. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will enhance and demonstrate their cultural literacy, knowledge, and skills in the target language, integrating the three modes of communication: interpretive (listening and reading), presentational (speaking and writing), and interpersonal (listening, speaking, reading, and writing). This course is required for all foreign language majors, except for those students pursuing teaching licensure. They are required to take 4925: Teaching Licensure Senior Capstone.

FREN 4925. Teaching Licensure Senior Capstone. Lec. 2. Credit 2.
Prerequisite: Senior Standing. Restricted to and required for all students pursuing a degree in Bachelor of Arts in French with SEED Licensure. This course is taken in the fall semester of the senior year. Exceptions must be approved by the Chair of the Department of Foreign Languages. In accordance with the School of Education, this course must be completed before entering teaching residency. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will integrate, enhance, and demonstrate the knowledge and skills learned during their undergraduate education in the areas of: speaking, listening comprehension, reading, writing and cultural literacy in the target language.

◆ Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).

Foreign Languages – German (GERM)

GERM 1010. Elementary German I. Lec. 3. Credit 3.
Essentials of German, developing listening and reading comprehension, oral and written communication, and cultural understanding.

GERM 1020. Elementary German II.

Lec. 3. Credit 3.

Prerequisite: GERM 1010. Essentials of German, developing listening and reading comprehension, oral and written communication, and cultural understanding. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

GERM 2010. Transition to Intermediate German.

Lec. 3. Credit 3.

Prerequisite: GERM 1020. Continuation of the essentials of German, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010-1020. Review as necessary. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

GERM 2020. Intermediate German.

Lec. 3. Credit 3.

Prerequisite: GERM 2010. Expansion of German language study, building on the fundamentals of German acquired in GERM 1010, GERM 1020, and GERM 2010. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

◆GERM 2520. German Culture and Civilization.

Lec. 3. Credit 3.

No background in German required. Introduction in English to German cultural history, geography and diversity, art, architecture, music and literature, and to the political and social structures and characteristics of Germany today in the context of the European Union. Credit will not be given for both GERM 2520 and GERM 3520.

GERM 3010. Written Communication in German.

Lec. 3. Credit 3.

Prerequisite: GERM 2020. Advanced grammar and composition course. Further development of written command of language structures with additional practice in listening and speaking, while exploring cultural topics. Emphasis on writing proficiency. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3020. Oral Communication in German.

Lec. 3. Credit 3.

Prerequisite: GERM 2020. Advanced conversation and grammar course. Further development of oral command of language structures with additional practice in writing and reading while exploring cultural topics. Emphasis on speaking proficiency. Required for majors. Students

with native-like fluency in German will substitute a different upper-level course for this one. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3112. German Civilization and Culture.

Lec. 3. Credit 3.

Prerequisite: GERM 2020. Introduction to Germany, its history and products of its culture, taught in German. Required for the German major. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3150. Introduction to German Literature.

Lec. 3. Credit 3.

Prerequisite: GERM 3010. Literature of the German-speaking countries from its earliest development to the present day. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3200. Business German. Lec. 3. Credit 3.

Prerequisite: GERM 3010. Business vocabulary, readings and conversations in German on various business topics and on culture as it affects business interactions, and practices in social and formal situations. Required for majors in International Business and Cultures who have a concentration in German. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

GERM 3520. Germany: The Country & the People.

Lec. 3. Credit 3.

No background in German required. An expanded version of GERM 3510 with some additional topics. No credit will be given for both GERM 3510 and GERM 3520.

GERM 4510. German Literature in English Translation.

Lec. 3. Credit 3.

Selected topics in German literature, with lectures and readings in English. No foreign language training is required.

GERM 4810 (5810). Special Topics in German.

Lec. 3. Credit 3.

Prerequisite: GERM 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 4910. Directed Studies in German.

Read. 1-6. Credit 1-6 per semester. Maximum 16. Prerequisite: GERM 3010 or equivalent or consent of instructor. Concentrated readings in areas of special

interest. Available to German majors on an individual basis, with consent of departmental chairperson.

GERM 4920. Senior Capstone. Ind. 3. Credit 3.
Prerequisite: Consent of the Chair of the Foreign Language Department. Senior Standing required, normally taken during the last semester before graduation. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will enhance and demonstrate their cultural literacy, knowledge, and skills in the target language, integrating the three modes of communication: interpretive (listening and reading), presentational (speaking and writing), and interpersonal (listening, speaking, reading, and writing). This course is required for all foreign language majors, except for those students pursuing teaching licensure. They are required to take 4925: Teaching Licensure Senior Capstone.

GERM 4925. Teaching Licensure Senior Capstone. Lec. 2. Credit 2.
Prerequisite: Senior Standing. Restricted to and required for all students pursuing a degree in Bachelor of Arts in German with SEED Licensure. This course is taken in the fall semester of the senior year. Exceptions must be approved by the Chair of the Department of Foreign Languages. In accordance with the School of Education, this course must be completed before entering teaching residency. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will integrate, enhance, and demonstrate the knowledge and skills learned during their undergraduate education in the areas of: speaking, listening comprehension, reading, writing and cultural literacy in the target language.

◆ **Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).**

Foreign Languages – Japanese (JAPN)

JAPN 3510. Japan: The Country and the People. Lec. 3. Credit 3.
No background in Japanese required. Introduction in English to the history, arts, geography, and business structures of Japan, and to the customs of Japanese society.

Foreign Languages – Russian (RUSS)

RUSS 1010. Elementary Russian I. Lec. 3. Credit 3.
Essentials of Russian, developing listening and reading

comprehension, oral and written communication, and cultural understanding.

RUSS 1020. Elementary Russian II. Lec. 3. Credit 3.
Prerequisite: RUSS 1010 or equivalent is prerequisite to 1020. Essentials of Russian, developing listening and reading comprehension, oral and written communication, and cultural understanding.

RUSS 2010. Transition to Intermediate Russian. Lec. 3. Credit 3.
Prerequisite: RUSS 1020 or equivalent. Continuation of the essentials of Russian, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010-1020. Review as necessary.

RUSS 2020. Intermediate Russian. Lec. 3. Credit 3.
Prerequisite: RUSS 2010 or equivalent. Expansion of Russian language study, building on the fundamentals of Russian acquired in 1010, 1020, and 2010.

RUSS 3510. Russia: The Country and the People. Lec. 2. Credit 2.
No background in Russian required. Introduction in English to the arts, geography, economics, and government of Russia and to the social characteristics of the people.

Foreign Languages – Spanish (SPAN)

SPAN 1010. Elementary Spanish I. Lec. 3. Credit 3.
Essentials of Spanish, developing listening and reading comprehension, oral and written communication, and cultural understanding. Students may enroll in SPAN 1010 or SPAN 1015, but not both. Native speakers of Spanish may not take this course.

SPAN 1015. Spanish for Health Services. Lec. 3. Credit 3.
Course restricted to Nursing majors. (Special permission is needed from instructor for all other majors.) Spanish language instruction for students entering the medical fields. They will learn the Spanish language—development of oral, reading, writing, and listening communication skills--and knowledge of Hispanic culture necessary to be able to communicate with their future Hispanic patients efficiently and effectively. Students may enroll in SPAN 1010 or SPAN 1015, but not both. Native speakers of Spanish may not take this course.

SPAN 1020. Elementary Spanish II.

Lec. 3. Credit 3.

Prerequisite: SPAN 1010 or SPAN 1015. Essentials of Spanish, developing listening and reading comprehension, oral and written communication, and cultural understanding. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 2010. Transition to Intermediate Spanish.

Lec. 3. Credit 3.

Prerequisite: SPAN 1020. Continuation of the essentials of Spanish, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010-1020. Review as necessary. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 2020. Intermediate Spanish.

Lec. 3. Credit 3.

Prerequisite: SPAN 2010. Expansion of Spanish language study, building on the fundamentals of Spanish acquired in 1010, 1020, and 2010. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

◆SPAN 2510. Spanish Culture and Civilization.

Lec. 3. Credit 3.

No background in Spanish required. This course is taught in English. Introduction to Spanish cultural and intellectual history, geography and diversity, arts and the political and social structures, and characteristics of Spain today. Credit will not be given for both SPAN 2510 and SPAN 3510.

◆SPAN 2550. Latin American Culture and Civilization.

Lec. 3. Credit 3.

No background in Spanish required. Introduction in English to Spanish Latin American cultural history, geography, cultural and ethnic diversity, art, music, literature and to the political and social structures that have shaped modern Latin America. Credit will not be given for both SPAN 2550 and SPAN 3550.

SPAN 3010. Written Communication in Spanish.

Lec. 3. Credit 3.

Prerequisite: SPAN 2020. Writing with additional practice in listening, speaking and reading, while exploring cultural topics. Required for the major. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 3020. Oral Communication in Spanish.

Lec. 3. Credit 3.

Prerequisite: SPAN 3010. Oral communication (speaking

and listening) with additional practice in writing and reading while exploring cultural topics. Required for majors. Students with native-like fluency in Spanish will substitute a different upper-level course for this one. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 3200. Spanish for Business I.

Lec. 3. Credit 3.

Prerequisite: SPAN 3010. Business vocabulary and readings in Spanish on various business topics and on culture as it affects business interactions and practices. Required for International Business and Cultures majors with language concentration in Spanish. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 3510. Spain: The Country and the People.

Lec. 3. Credit 3.

No background in Spanish required. Introduction in English to the history, arts, geography, and government of Spain and to the civilization and social characteristics of the Spanish people.

SPAN 3550. Latin America: The Countries and the Peoples.

Lec. 3. Credit 3.

No background in Spanish required. Introduction in English to the history, arts, geography, and governments of the Spanish-speaking countries of Latin America and to the civilization and social characteristics of the people.

SPAN 4010 (5010). Introduction to the Literature of Spain.

Lec. 3. Credit 3.

Prerequisite: SPAN 3010. Selections from the literature of Spain. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4020 (5020). Introduction to the Literature of Spanish America.

Lec. 3. Credit 3.

Prerequisite: SPAN 3010. Selections from the literature of Spanish America. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4030 (5030). Advanced Spanish Conversation.

Lec. 3. Credit 3.

Prerequisite: SPAN 3020. Discussion in Spanish on political, medical, legal and business topics. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4110 (5110). Culture and Civilization of Spain.

Lec. 3. Credit 3.

Prerequisite: SPAN 3010. Lectures, readings and discussion in Spanish on the culture and civilization of Spain. Qualified students may be able to take this

course without the prerequisite by contacting the instructor.

SPAN 4120 (5120). Culture and Civilization of Spanish America. Lec. 3. Credit 3.

Prerequisite: SPAN 3010. Lectures, readings, and discussion in Spanish on the culture and civilization of Spanish America. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 4810. Special Topics in Spanish.

Lec. 3. Credit 3.

Prerequisite: SPAN 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 4910. Directed Studies.

Read. 1-6. Credit 1-6 per semester. Maximum 16. Prerequisite: SPAN 3010 or equivalent or consent of instructor. Concentrated studies in areas of special interest. Available on an individual basis, with consent of departmental chairperson.

SPAN 4920. Senior Capstone. Ind. 3. Credit 3.

Prerequisite: Consent of the Chair of the Foreign Language Department. Senior Standing required, normally taken during the last semester before graduation. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will enhance and demonstrate their cultural literacy, knowledge, and skills in the target language, integrating the three modes of communication: interpretive (listening and reading), presentational (speaking and writing), and interpersonal (listening, speaking, reading, and writing). This course is required for all foreign language majors, except for those students pursuing teaching licensure. They are required to take 4925: Teaching Licensure Senior Capstone.

SPAN 4925. Teaching Licensure Senior Capstone.

Lec. 2. Credit 2.

Prerequisite: Senior Standing. Restricted to and required for all students pursuing a degree in Bachelor of Arts in Spanish with SEED Licensure. This course is taken in the fall semester of the senior year. Exceptions must be approved by the Chair of the Department of Foreign Languages. In accordance with the School of Education, this course must be completed before entering teaching residency. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will integrate, enhance, and demonstrate the knowledge and skills learned during their undergraduate education in the

areas of: speaking, listening comprehension, reading, writing and cultural literacy in the target language.

◆ **Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).**

Foundations of Education (FOED)

FOED 1820. Introductory Field Experience.

Lec. 1. Credit 1.

Corequisite: FOED 2011. Observation and discussion of authentic educational settings appropriate for licensure area(s). For all licensure majors, not available for freshmen. A minimum grade of B is required to meet degree requirements.

FOED 1821. Introductory Field Experience in Speech and Theatre Education.

Lab. 3. Credit 1.

Application of FOED 1010 content in lab and field experiences including supervised observation in educational settings. For SEST licensure students.

FOED 1822. Introductory Field Experience and Orientation.

Lec. 1. Credit 1.

Corequisite: FOED 2011. Observation and discussion of authentic educational settings appropriate for licensure area(s). For freshmen only. A minimum grade of B is required to meet degree requirements.

FOED 2011. Introduction to Teaching and Technology.

Lec. 2. Credit 2.

Corequisite: FOED 1820, all licensure majors. FOED 1822, for freshmen only. An overview of school in America, the role and responsibility of the teacher, and an introduction to instructional technology principles and practices. A minimum grade of B is required to meet degree requirements.

FOED 3010. Integrating Instructional Technology into the Classroom.

Lec. 3. Credit 3.

Prerequisite: FOED 2011 or the equivalent. Using, integrating and evaluating instructional technology in today's classroom. Requirement: A minimum of grade of B to demonstrate a candidate's competency in technology integration prior to Residency I.

FOED 3240. Instructional Technology I.

Lec. 2. Credit 2.

Development of an application of basic audio-visual and computer skills to facilitate quality instruction in the classroom. Credit cannot be obtained for CSC 1100 in addition to credit for either DS 2810 or FOED 3240.

FOED 3310. Microcomputers in Employment/Education.

Credit 2.

Windows-based microcomputers in employment and

education. Focusing on work processing, spreadsheet, database, graphics, internet applications, and other computer tools.

FOED 3340. Instructional Technology II.

Lec. 1. Lab. 4. Credit 3.

Prerequisite: FOED 3240. Selection, operation, use, and integration of instructional technology in today's classroom.

FOED 3800. Field Experiences in Education.

Lab. 4-12. Credit 1-3.

Prerequisite: Full admission to the Teacher Education Program. Supervised work experiences in public schools stressing the translation of theory into practice. A minimum grade of B is required to meet degree requirements.

FOED 3810. Field Experiences in Education.

Lab. 4-12. Credit 1-2.

Prerequisite: Full admission to the Teacher Education Program. Supervised work experiences in public schools stressing the translation of theory into practice. A minimum grade of B is required to meet degree requirements.

FOED 3820. Field Experiences in Education.

Lab. 4-12. Credit 1-2.

Prerequisite: Full admission to the Teacher Education Program. Supervised work experiences in public schools stressing the translation of theory into practice. A minimum grade of B is required to meet degree requirements.

FOED 3830. Field Experiences in Education.

Lab. 4-12. Credit 1.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: CUED 4150. Supervised work experiences in public schools stressing the translation of theory into practice. A minimum grade of B is required to meet degree requirements.

FOED 3840. Field Experiences in ESL.

Lab. 4-12. Credit 1-3.

Prerequisite: Full admission to the Teacher Education Program. Supervised work experiences in public schools stressing the translation of theory into practice. A minimum grade of B is required to meet degree requirements for licensure candidates.

FOED 4340. Technology for Presentations.

Credit 3.

Prerequisite: FOED 3310. Development of knowledge and skills necessary for communications and presentations using various instructional technologies and Windows computer software.

Geography (GEOG)

GEOG 1010. Weather and Climate.

Lec. 3. Credit 3.

Introduction to weather and climate, landforms, soils, vegetation, and water.

◆GEOG 1012. Cultural Geography.

Lec. 3. Credit 3.

Distribution of people and their activities as they are related to the earth.

(GEOG 1030, TTP Course)**GEOG 1035. World Regional Geography I.**

Lec. 3. Credit 3.

This course examines the political, economic, demographic and environmental shifts happening in the world today. Throughout this course, students will be exposed to the following concepts: globalization, development of world regions, issues of people and land, diversity of cultures and regions, global changes and local responses, cultural and political landscapes, global economics, and environmental issues.

(GEOG 2010, TTP Course)**GEOG 1100. Global Climate Change.**

Lec. 3. Credit 3.

This is an introduction to the Earth's global climate from an Earth-systems perspective. We will investigate prehistoric and historic fluctuations in Earth's climate, the current climate system, and projections for future climate and climate impacts.

◆GEOG 1130. Geography of Natural Hazards.

Lec. 3. Credit 3.

The societal and economic impact of natural hazards including flooding, hurricanes, tornadoes, volcanoes, earthquakes, landslides, disease, wildfire, drought, famine, and climate change. The response of governments, cultures, and individuals to natural hazards.

◆GEOG 2100. Introduction to Meteorology.

Lec. 3. Lab. 2. Credit 4.

An introduction to atmospheric science and elements controlling daily weather. Global and local scale atmospheric processes, atmospheric hazards, weather monitoring and technology, forecasting, global climates, and climate change.

GEOG 3010. Geography of the United States.

Lec. 3. Credit 3.

Prerequisite: GEOG 1010. The United States and its physical environment, resources and cultural development.

GEOG (GEOL) 3200. Water Resources.

Lec. 3. Credit 3.

This course deals with water as a resource basic for life on Earth. Topics to be covered include: dams and reservoirs, irrigation, inter-basin transfers, river channel modification, flood control, water quality, and water law.

GEOG 3330. Meteorology. Lec. 3. Lab. 2. Credit 4.

Earth's atmosphere and the mechanics and causes of day to day weather changes.

GEOG (GEOL) 4150 (5150). Geomorphology.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: GEOL 2500. Analysis of landforms and processes that shape them.

GEOG 4210 (5210). Cartography.

Lec. 2. Lab. 2. Credit 3.

Principles and practices of map construction and interpretation.

GEOG (GEOL) 4410 (5410). Remote Sensing.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: GEOL 2500. Principles and applications of remote sensing. Provides a survey of the concepts and techniques of remote sensing and image analysis for natural resources, geomorphology, and Earth surface processes.

GEOG 4510 (5510). Theory of GIS I.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Introduction to 1) the PC ARC/INFO GIS package, 2) ArcView GIS package, and 3) the integration of Global Positioning Systems (GPS) with GIS.

GEOG 4511 (5511). Theory of GIS II.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor and GEOG 4510 (5510). Intermediate principles of GIS using ArcGIS and ArcView packages. Advanced integration of GPS and GIS. Spatial analysis and modeling capabilities of GIS emphasized.

GEOG 4620 (5620). Principles of GIS.

Lec. 3. Credit 3.

Introduction to the fundamentals of GIS. Theoretical and technical principles of managing and processing geographic data, nature of geographic data, spatial data models of map projection systems, kriging, structures, and spatial analytical and modeling techniques.

GEOG 4650 (5650). Environmental Applications of GIS.

Lec. 3. Credit 3.

Prerequisite: GEOG 4510 (5510). Applications of GIS in environmental sciences and engineering. Main emphasis is on approaches, scripting, and modeling exercises.

Covers the scope of ecosystems, forestry, drainage basins, pollution modeling, and spatial analysis of contaminants in various environments using GIS as the main tool of analysis. Completion of a real-world GIS project is required.

GEOG (GEOL) 4711 (5711). Hydrogeology.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: GEOL 1040 and GEOL 1045. Occurrence and movement of ground water, well hydraulics, water quality, and pollution.

GEOG 4810. Special Problems.

Credit 1-4.

Prerequisite: Consent of instructor. Research course on topics of significance in the field of geography. A paper reporting the results of this research is required. Course may be taken for credit more than once.

GEOG 4820. Special Problems.

Credit 1-4.

Prerequisite: Consent of instructor. Research course on topics of significance in the field of geography. A paper reporting the results of this research is required. Course may be taken for credit more than once.

GEOG 4850 (5850). Advanced GIS.

Lec. 3. Credit 3.

Prerequisite: GEOG 4510 (5510). Advanced topics in GIS, including writing of avenue scripts, writing and importing Visual Basic scripts, customization of the interface; customization of spatial, network, and 3D extensions of ArcView and AML.

GEOG (GEOL) 4930. Senior Thesis.

Credit 3.

Prerequisite: Consent of instructor. Supervised independent study of an original research problem. Student is required to make a research proposal, collect data, review appropriate literature, write a paper, and present orally the results of the research problem. (Available only to Geology majors.)

GEOG (GEOL) 4931. Senior Thesis.

Credit 3.

Prerequisite: GEOL 4930 and consent of instructor. Supervised independent study of an original research problem. Student is required to make a research proposal, collect data, review appropriate literature, write a paper and present orally the results of the research problem. (Available only to Geology majors.)

◆ **Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).**

Geology (GEOL)

GEOL 1020. Field Experiences in the Geosciences.

Lec. 2. Credit 1.

This course will introduce students interested in science

to the practice of scientific research in the field and the laboratory, with emphasis on the geosciences. Field trips and in-class activities will stimulate critical thinking and real-world problem-solving skills unique to the sciences. Current geosciences-related issues will be discussed in class (e.g. Sumatra tsunami, Himalayan earthquakes).

◆**GEOL 1040. Physical Geology.**

Lec. 3. Lab. 2. Credit 4.

Origin and classification of minerals and rocks; geologic processes and landform development. Credit will not be given for both: 1)GEOL 1040 and GEOL 1310, 2)GEOL 1040 and GEOL 3210, and 3)GEOL 1310 and GEOL 3210.

◆**GEOL 1045. Earth Environment, Resources and Society.**

Lec. 3. Lab. 2. Credit 4.

Application of physical geology principles to geologic hazards, environmental pollution, and land/resource use.

GEOL 1046. Earth Environment, Resources and Society.

Lec. 3. Credit 3.

Application of physical geology principles to geologic hazards, environmental pollution, and land/resource use. This course cannot be taken as part of the university natural sciences requirement and credit will not be given for both GEOL 1046 and GEOL 1045.

◆**GEOL 1070. Concepts of Geology.**

Lec. 2. Lab. 3. Credit 3.

Introduction to the earth sciences: minerals and rocks, resources, geologic processes, water, earthquakes, maps, folds and faults, geologic time, continental drift, weather, and climate. This course will not count as part of a geology sequence. Credit will not be given for both: 1)GEOL 1040 and GEOL 1070, 2)GEOL 1040 and GEOL 3210, and 3)GEOL 1070 and GEOL 3210.

GEOL 2000. Earth Evolution and Life History.

Lec. 3. Credit 3.

Prerequisite: GEOL 1040. Illustrate how biological and geological interactions have influenced life patterns and Earth history and how these processes continue to shape human history today. Also, the impact of human population upon these Earth systems.

GEOL 2010. Topical Minicourse in Geology.

Credit 1.

Independent study including library and outdoor projects. No formal classwork is required. Not intended for Geosciences majors.

GEOL 2500. Geological Fundamentals.

Lec. 2. Lab. 2. Credit 3.

Prerequisite or corequisite: GEOL 1040. Basic geologic

field techniques and map reading. Detailed study of rocks and minerals.

GEOL 2510. Oceanography 1. Physical, Chemical and Geological.-Summer.

Credit 5.

Prerequisite: College Algebra, eight semester hours of Chemistry. Fundamentals of Oceanography integrating chemical, geological, and physical Oceanography. The following course is offered at the Gulf Coast Research Laboratories.

GEOL 3010. Dinosaurs.

Lec. 3. Credit 3.

Recent concepts in the study of dinosaurs, including their paleobiology, relationships to other organisms, extinction, and distribution in space and time.

GEOL 3110. Principles of Mineralogy and Petrology.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: GEOL 1040 and CHEM 1110. Physical properties of minerals; identification of basic rock-forming minerals, elements of rock classification, and megascopic properties of common rocks.

GEOL 3120. Mineralogy.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: CHEM 1120, GEOL 3110 and MATH 1720. Geometrical crystallography; determination of silicate and nonsilicate minerals by physical properties, chemical tests, and X-ray diffraction.

GEOL (GEOG) 3200. Water Resources.

Lec. 3. Credit 3.

This course deals with water as a resource basic for life on Earth. Topics to be covered include: dams and reservoirs, irrigation, inter-basin transfers, river channel modification, flood control, water quality, and water law.

GEOL 3210. Geology for Engineers.

Lec. 2. Lab. 2. Credit 3.

Introduction to principles of Geology and practical application of Geology to Engineering problems. Credit will not be given for both: 1)GEOL 1040 and GEOL 1310, 2)GEOL 1040 and GEOL 3210, and 3)GEOL 1310 and GEOL 3210.

GEOL 3230. Structural Geology and Tectonics.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: GEOL 1040 or GEOL 3210. The mechanisms of plate tectonics and the geologic structures that result from rock deformation; application of methods for structural analysis in the field and the lab.

GEOL 3350. Paleobiology.

Lec. 3. Credit 3.

Prerequisite: Junior Standing and one of the following courses: GEOL 1040, GEOL 2000, BIOL 1010, BIOL 1020, BIOL 1105 or BIOL 1114. Survey of biologic and geologic principles related to preservation, variation,

classification, speciation, evolution, paleoecology, and biogeography or fossil invertebrates.

GEOL 3410. Paleontology.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: GEOL 1040, GEOL 1045 or BIOL 1105. Systematics, morphology, stratigraphic distribution, and evolutionary significance of all major taxa of invertebrate macrofossils and selected microfossils.

GEOL 3550. Paleoclimates.

Lec. 3. Lab. 2. Credit 4

Prerequisite: GEOL 1040, GEOL 1045, or GEOL 3210. Principles of the Earth's climate system, including proxies used for paleoclimate studies and the history of climate change throughout geological time.

GEOL 3750. Stable Isotope Geochemistry.

Lec. 3. Lab 2. Credit 4.

Prerequisites: GEOL 2500 and CHEM 1110. Course Description: This course will emphasize the geochemical elements of the Earth system. We will look at the nomenclature of stable isotope systems and look at the application to earth and environmental systems.

GEOL 3830. Field Geology.

Credit 4.

Prerequisite: GEOL 1040 and GEOL 2500. Introduction to field methods involving the identification and tracing of geologic formations, aerial mapping and structure contouring. Eight hours field work per week.

GEOL 4040. Summer Field Geology.

Credit 4-9.

Field course in geological mapping.

GEOL 4100. Environmental Sedimentology.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: GEOL 1040. Basic sampling and analytic techniques to determine compositions and textures of non-lithified sediments and the use of grain-sized distributions to interpret depositional process. Field trips will be taken to examine modern river and coastal deposits.

GEOL 4110. Sedimentation and Stratigraphy.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: GEOL 1040 and GEOL 2500. Fundamental depositional processes, sedimentary structures, and facies models of siliciclastic and carbonate sedimentary rocks. Basic stratigraphy concepts, methods of correlation, and introduction to sequence stratigraphy.

GEOL (GEOG) 4150 (5150). Geomorphology.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: GEOL 1040 and GEOL 2500 or consent of instructor. Analysis of landforms and processes that shape them.

GEOL 4200. Geological Exploration Techniques.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: GEOL 1040, GEOL 1045 and GEOL 2500. Practical techniques for geological exploration, with emphasis on environmental, mining, and petroleum industry applications. Surface and subsurface methods include geological mapping, drilling, core extraction, wireline logging and 2D/3D seismic.

GEOL 4210. Advanced Historical Geology.

Lec. 3. Credit 3.

Prerequisite: Completion of core curriculum in Geology and GEOL 3410. Advanced treatment of the Earth's history concentrating on plate tectonics, evolution of the biosphere and chemical changes from the Archaean to the Holocene.

GEOL 4300 (5300). Environmental Aqueous Geochemistry.

Lec. 3. Credit 3.

Prerequisite: GEOL 1040, CHEM 1010 or CHEM 1110, or consent of instructor. Principles of water quality, chemical thermodynamics and equilibrium; chemical reactions; modeling of aquatic systems and a survey of practical applications of equilibrium aqueous geochemistry.

GEOL (GEOG) 4410 (5410). Remote Sensing.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: GEOL 2500 and GEOL 3230 or consent of instructor. Principles and applications of remote sensing. Provides a survey of the concepts and techniques of remote sensing and image analysis for natural resources, geomorphology, and Earth surface processes.

GEOL 4610. Optical Mineralogy and Petrography.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: GEOL 3120. Theory and use of the petrographic microscope in mineral optics, and study of rocks in thin sections using the petrographic microscope.

GEOL 4650 (5650). Applied Geochemistry.

Lec. 3. Credit 3.

Prerequisite: GEOL 1040 and CHEM 1110. Application of geochemistry to mineral exploration, environmental pollution, public health, and geologic hazards. Three field trips required.

GEOL (GEOG) 4711 (5711). Hydrogeology.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: GEOL 1040 and GEOL 1045; CHEM 1120; MATH 1830 or MATH 1730 (MATH 1910 is recommended); or consent of instructor. Occurrence and movement of ground water, well hydraulics, water quality, and pollution.

GEOL 4810 (5810). Special Problems. Credit 1-4.
Prerequisite: Major and consent of instructor. Advanced students may do independent investigations in some approved field. Course may be taken for credit more than once.

GEOL 4820 (5820). Special Problems. Credit 1-4.
Prerequisite: Major and consent of instructor. Advanced students may do independent investigations in some approved field. Course may be taken for credit more than once.

GEOL (GEOG) 4930. Senior Thesis. Credit 3.
Prerequisite: Consent of instructor. Supervised independent study of an original research problem. Student is required to make a research proposal, collect data, review appropriate literature, write a paper, and present orally the results of the research problem. (Available only to Geology majors.)

GEOL (GEOG) 4931. Senior Thesis. Credit 3.
Prerequisite: GEOL 4930 and consent of instructor. Supervised independent study of an original research problem. Student is required to make a research proposal, collect data, review appropriate literature, write a paper and present orally the results of the research problem. (Available only to Geology majors.)

◆ **Meets Tennessee Technological University general education requirement (Natural Sciences).**

History (HIST)

HIST 1066. First Year Connections. Lec. 1. Credit 1.
This course is designed to provide the students an enlarged perspective with which to succeed as History majors at Tennessee Technological.

◆ **HIST 1310. Science and World Cultures.** Lec. 3. Credit 3.
Historical development of science in select world cultures, from the ancient world into the 20th century.

HIST 2000. Introduction to United States History. Lec. 3. Credit 3.
An exploration of the chronology and major themes in U.S. History with special attention to geography and terminology, for students who have not completed one year of U.S. History in high school (including international students).

◆ **HIST 2010. Early United States History.** Lec. 3. Credit 3.
Colonial heritage; Independence; Nationalism and Expansion; Rise of Democracy, Reform, and

Sectionalism; and Civil War and Reconstruction.

◆ **HIST 2020. Modern United States History.** Lec. 3. Credit 3.
Industrialism and Urbanism; World Power; Reform; World War I and aftermath; New Deal; World War II; Prosperity; and the Cold War.

HIST 2030. History of Tennessee. Lec. 3. Credit 3.
Survey of Tennessee history from the earliest settlement to the present.

◆ **HIST 2210. Early Western Civilization.** Lec. 3. Credit 3.
Classical Greece and Rome; transformation of the West during Middle Ages; Renaissance; Reformation; rise of national states; and expansion overseas.

◆ **HIST 2220. Modern Western Civilization.** Lec. 3. Credit 3.
Enlightenment; French Revolution; Industrialism, Liberalism, Nationalism, and Imperialism; World Wars; and Europe in mid-20th Century.

◆ **HIST 2310. Early World History.** Lec. 3. Credit 3.
Development of the human community from pre-history to the year 1500.

◆ **HIST 2320. Modern World History.** Lec. 3. Credit 3.
World History since 1500, including the development of modern science, the rise of the nation-state, European hegemony, colonialism, and anti-colonialism.

HIST 3100. Tennessee Topics. Lec. 3. Credit 3.
Prerequisite: Select two: HIST 2010, HIST 2020 or HIST 2030. Political, military, social, and cultural topics in Tennessee history.

HIST 3360. American Military History. Lec. 3. Credit 3.
U.S. military affairs, emphasizing war, role of officer corps, and relation of military to managerial, technological, and social change.

HIST 3410. Introduction to Historical Methods. Lec. 3. Credit 3.
Prerequisite: Permission required. An introduction to historical writing, research, criticism, methodology, and related technical skills.

HIST 3550. The Classical World. Lec. 3. Credit 3.
Rise of ancient Greek culture and its transformation in the Hellenistic and Roman periods to the death of Justinian (565 A.D.).

HIST 3710. Survey of Spanish History.

Lec. 3. Credit 3.

The political, economic, and cultural development of Spain from the earliest time to the present.

HIST 3900. Environmental History.

Lec. 3. Credit 3.

The history of human impact on the North American environment and the resulting effects on society.

HIST 4010 (5010). Colonial and Revolutionary Periods.

Lec. 3. Credit 3.

Early American Society; Revolutionary conflict; and the Confederation and Constitution.

HIST 4020 (5020). The Young Republic, 1789-1849.

Lec. 3. Credit 3.

Political, military, social and cultural history of the U.S., from the era of Washington through the "Age of Jackson" to the Mexican War.

HIST 4030 (5030). Civil War and Reconstruction, 1849-1877.

Lec. 3. Credit 3.

Sectionalism and the coming war; war-time developments; and plans of reconstruction and their impact.

HIST 4040 (5040). Rise of Modern America, 1877-1912.

Lec. 3. Credit 3.

Industrialism, urbanism, populism, reform, and their impact.

HIST 4050 (5050). The Transformation of Modern America, 1912-1945.

Lec. 3. Credit 3.

Wilsonian reform, World War I, New Era, New Deal, World War II, with emphasis on changes in politics, the economy, and society.

HIST 4060 (5060). Postwar America, 1945-Present.

Lec. 3. Credit 3.

Cold War diplomacy and society, troubled Sixties, post-Watergate politics, and contemporary cultural, economic, and social changes.

HIST 4090 (5090). 20th Century U.S. Popular Culture.

Lec. 3. Credit 3

An examination of various themes and genres in 20th Century U.S. Popular Culture in the context of contemporary events.

HIST 4200 (5200). The Old South.

Lec. 3. Credit 3.

This course will focus upon the economic, cultural, educational, racial, and political developments in Southern society from its colonial beginnings to the Civil War and Reconstruction.

HIST 4210 (5210). The South.

Lec. 3. Credit 3.

Southern life to the present, emphasizing economic, cultural, educational, racial, and political problems.

HIST 4230-4239 (5230). Topics in U.S. Economic History.

Lec. 3. Credit 3.

Selected topics in U.S. economic history.

HIST 4250 (5250). American Westward Movement.

Lec. 3. Credit 3.

The frontier experience in American history, with emphasis on the trans-Mississippi West.

HIST 4290 (5290). Science and Technology in America.

Lec. 3. Credit 3.

Origins and development of science and technology in the U.S. from the colonial period to the present.

HIST 4310 (5310). U.S. Diplomacy.

Lec. 3. Credit 3.

The background, origins, and developments of 20th century American foreign relations.

HIST 4330-4339 (5330). Religious Studies.

Lec. 3. Credit 3.

Selected topics in religious history.

HIST 4350-4359 (5350). Gender Studies.

Lec. 3. Credit 3.

Selected topics in gender history.

HIST 4360-4369 (5360). U.S. Social History.

Lec. 3. Credit 3.

Selected topics in U.S. Social History, ranging from the Colonial period to the present.

HIST 4370 (5370). Women in American History.

Lec. 3. Credit 3.

Public and private experiences of women in the United States from the colonial period to the present.

HIST 4390-4399 (5390). Topics in African American Studies.

Lec. 3. Credit 3.

Selected topics in African American history.

HIST 4400-4409 (5400). Film Studies.

Lec. 2. Lab. 2. Credit 3.

Selected topics in the history of films.

HIST 4420. Public History.

Lec. 3. Credit 3.

Prerequisite: HIST 3410. Introduce history majors to possible careers in the field and give students practical, hands-on experience in the field of Public History.

HIST 4440-4449 (5440). Native American Studies.

Lec. 3. Credit 3.

Prerequisite: Consent of the instructor. Selected topics in

Native American history, ranging from the earliest times to the present.

HIST 4470-4479 (5470). Sports Studies.

Lec. 3. Credit 3.

Selected topics in the history of sports.

HIST 4520 (5520). Medieval Europe.

Lec. 3. Credit 3.

Evolution of Medieval culture from the fall of the Roman Empire to the 13th century and its dissolution during the late medieval period.

HIST 4530 (5530). Renaissance and Reformation.

Lec. 3. Credit 3.

Europe during age of New Learning; Renaissance and Mannerist art; 16th century Reformation; and Wars of Religion.

HIST 4540 (5540). Absolutism and Enlightenment.

Lec. 3. Credit 3.

Europe during 17th and 18th centuries; rise of centralized states; dynastic wars and rise of modern science; and Enlightenment thought.

HIST 4550 (5550). French Revolution and Napoleon.

Lec. 3. Credit 3.

Europe from 1789 to 1815, centering on events in France and political, diplomatic, and military history of the period.

HIST 4560 (5560). 19th Century Europe.

Lec. 3. Credit 3.

European politics, diplomacy, society, war, and institutions from 1815 through World War I.

HIST 4570 (5570). World War II and the Cold War.

Lec. 3. Credit 3.

Problems of European powers during inter-war years; background, causes, and results of World War II and Cold War.

HIST 4620 (5620). Russia.

Lec. 3. Credit 3.

Political, cultural, social, and military history from the Kievan period to the present.

HIST 4630. History of France.

Lec. 3. Credit 3.

Considers the historical development of France.

HIST 4640. History of Modern Germany.

Lec. 3. Credit 3.

History of Modern Germany with an emphasis on the nineteenth and twentieth centuries.

HIST 4650 (5650). England to 1688.

Lec. 3. Credit 3.

Roman, Anglo-Saxon, and Medieval England; Tudor and Stuart Dynasties.

HIST 4660 (5660). Modern England.

Lec. 3. Credit 3.

England since the Glorious Revolution, with special emphasis on the 19th and 20th centuries.

HIST 4665. World War I.

Lec. 3. Credit 3.

Considers World War I and its consequences within the political, social, and cultural contexts of European development since 1871.

HIST 4680 (5680) The Holocaust.

Lec. 3. Credit 3

Considers topics relating to the history of the Holocaust.

HIST 4690 (5690). British Empire and Commonwealth.

Lec. 3. Credit 3.

Origin, development, and decline of the British Empire.

HIST 4710. History of Africa.

Lec. 3. Credit 3.

History of Africa with emphasis on the nineteenth and twentieth centuries.

HIST 4730 (5730). The Modern Middle East.

Lec. 3. Credit 3.

Consideration of the traditional cultural background of the region but with emphasis on the rapid changes experienced during the 20th century.

HIST 4740 (5740). History of Japan.

Lec. 3. Credit 3.

Early Japanese history followed by a comprehensive investigation of the 20th century experience.

HIST 4750 (5750). History of China.

Lec. 3. Credit 3.

Early Chinese history followed by an emphasis on the 20th century revolutionary experience.

HIST 4760 (5760). Vietnam: Its Wars and Their Aftermath.

Lec. 3. Credit 3.

Overview of Vietnam, the French experience, and the U.S. war and its impact on America, followed by developments since 1975.

HIST 4790-4799 (5790). Latin American Studies.

Lec. 3. Credit 3.

Selected topics in Latin American history.

HIST 4810 (5810). Scientific Controversies.

Lec. 3. Credit 3.

Historical analysis of selected controversies in science and their impact within and outside the scientific community.

HIST 4880 (5880). History of Medicine.

Lec. 3. Credit 3.

Considers the history of medicine and the medical field.

HIST 4880-4889. Studies in Legal History.

Lec. 3. Credit 3.

Considers issues relating to legal history.

HIST 4890 (5885) History of Nursing and Healthcare.

Lec. 3. Credit 3.

Considers issues relating to the history of nursing and healthcare.

HIST 4900-4909. Topics.

Lec. 3. Credit 3.

A formal course in any area where there is no other course offering.

HIST 4910-4919. Directed Studies. Credit 1, 2, 3.

Prerequisite: Consent of instructor. Supervised research and reading in any area where there is no appropriate course offering.

HIST 4940. History Internship.

Credit 3.

Prerequisite: Twelve hours of History courses. Students develop specific skills in the research and/or the interpretation of history by working with archives, museums, historic sites, attorneys, and other relevant professionals.

HIST 4990-4999. Senior Seminar.

Sem. 3. Credit 3.

Prerequisite: HIST 3410 and Junior or Senior standing as a History major. Must be taken at TTU, no transfer credit allowed. Intensive experience in research, writing, and oral presentation of a selected historical topic.

◆ Meets Tennessee Technological University general education requirement (History).

Honors (HON)

HON 1010. Introduction to Honors.

Credit 1.

Prerequisite: Consent of Honors Program director. An introduction to the Honors Program and to the University, taught by the Honors directors and outstanding faculty.

HON 2010. Special Topics.

Credit 1, 2, 3.

Prerequisite: Consent of Honors Program director. A non-departmental course on self-development for Honors students approved by the Honors Council.

HON 2020. Special Topics.

Credit 1, 2, 3.

Prerequisite: Consent of Honors Program director. Non-departmental special topics approved by the Honors Council.

HON 2042. Honors Computer Intern.

Int. 2-3. Credit 2-3.

Students may take this course up to three times.

HON 2043. Honors Computer Intern.

Int. 2-3. Credit 2-3.

Students may take this course up to three times.

HON 2051. Peer Mentoring.

Int. 1-2. Credit 1-2.

Students may take this course up to three times.

HON 2052. Peer Mentoring.

Int. 1-2. Credit 1-2.

Students may take this course up to three times.

HON 2063. Director Intern.

Int. 3. Credit 3.

Students may take this course up to three times.

HON 2090. Special Topics.

Credit 1, 2, 3.

Prerequisite: Consent of Honors Program director. Non-departmental special topics approved by the Honors Council.

HON 2171. Honors Leadership Development.

Sem. 1-2. Credit 1-2.

Prerequisite: Permission of the Honors Director.

Students may take this course up to three times.

HON 2172. Honors Leadership Development.

Sem. 1-2. Credit 1-2.

Prerequisite: Permission of the Honors Director.

Students may take this course up to three times.

HON 4011. Colloquium.

Credit 1, 2, 3.

Prerequisite: Consent of the Honors Program director. A non-departmental course for Honors students on a topic approved by the Honors Council, directed by a member of the Honors faculty.

HON 4012. Colloquium.

Credit 1, 2, 3.

Prerequisite: Consent of the Honors Program director. A non-departmental course for Honors students on a topic approved by the Honors Council, directed by a member of the Honors faculty.

HON 4013. Colloquium.

Credit 1, 2, 3.

Prerequisite: Consent of the Honors Program director. A non-departmental course for Honors students on a topic approved by the Honors Council, directed by a member of the Honors faculty.

HON 4021. Directed Studies.

Credit 1, 2, 3.

Prerequisite: Consent of the Honors director. A non-departmental course of independent study available to Honors students on an individual basis.

HON 4022. Directed Studies.

Credit 1, 2, 3.

Prerequisite: Consent of the Honors director. A non-

departmental course of independent study available to Honors students on an individual basis.

HON 4023. Directed Studies. Credit 1, 2, 3.
Prerequisite: Consent of the Honors director. A non-departmental course of independent study available to Honors students on an individual basis.

HON 4033. Research for Thesis. Credit 3.
Prerequisite: Consent of the Honors Director. Students complete a 30-page literature review and prospectus for an Honors thesis.

HON 4043. Honors Thesis. Credit 3.
Prerequisite: Consent of the Honors Director. Students use material from HON 4033 and complete and defend an Honors thesis.

Human Ecology (HEC)

Core

HEC 1005. Introduction to Human Ecology. Lec. 1. Credit 1.
History, philosophy, trends and professional issues for the discipline of Human Ecology/Family and Consumer Sciences. Exploration of career opportunities and connection to professional organizations.

HEC 1010. Life Span Development. Lec. 3. Credit 3.
Development of individuals and families across the life span and factors that influence this development. Focus on biological, cognitive, and socio-emotional processes.

HEC 1020. Social and Professional Etiquette. Lec. 1. Credit 1.
Appropriate social and professional standards of behavior as applied to the family, community and workplace environments.

HEC 1030. Introduction to Nutrition. Lec. 2. Credit 2.
Principles of basic nutrition for personal lifestyle choices and selection of foods for promotion and maintenance of health throughout the lifespan.

HEC 2020. Nutrition for Health Sciences. Lec. 3. Credit 3.
Prerequisite: Completion of 15 credit hours. Principles of nutrition. Emphasis upon the function, food sources, recommended intake and assimilation of each of the six nutrient classes. HEC 1030 cannot be substituted for HEC 2020.

HEC 2041. Aspects of Housing and Furnishings. Lec. 3. Credit 3.

Designed environment with emphasis on interior components of the house and the impact on individuals and families.

HEC 2065. Families in Society. Lec. 3. Credit 3.
The family as a social system. Exploration of ecological systems perspective to understand family-community relationships, including emphasis on children with special needs. Identify globalization of societal trends affecting families. HEC 2065 is not a substitute for HEC 2060.

HEC 3011. Consumer Economics. Lec. 3. Credit 3.
Prerequisite: Junior or Senior Standing. Management of individual and family resources with emphasis on the production, allocation and consumption of goods and services.

General Human Ecology Courses

HEC 2365. Social Media in the Workplace. Lec. 1. Credit 1.
Practical exploration of social media principles and practices, towards developing meaningful results and marketing strategies for business applications. Examination of the implications of using social media in the workplace and how it may be separated from personal communication.

HEC 4325. Sustainable Apparel. Lec. 1., Lab. 4. Credit 3.
Prerequisite: HEC 2355 or consent of instructor. Design and construction of sustainable apparel and textile products with focus on sustainability, construction techniques, designers, and manufacturers of sustainable textile products.

HEC 4900. Special Topics. Credit 1-7.
Prerequisite: Departmental approval. Research in contemporary developments in human ecology. May be repeated. Maximum seven hours.

HEC 4920. Study Tour. Lec. 3. Credit 1-3.
Study and observation of consumer services and product industries. May be repeated.

HEC 4960. Independent Study in Human Ecology. Credit 1, 2, 3.
Prerequisite: Consent of instructor. Special study of an approved topic (area) within Human Ecology under the supervision of a member of the human ecology faculty. Up to six credit hours may be earned by independent study.

HEC 4990. Professional Internship.

Credit 3, 6, 8, 12.

Prerequisite: Departmental approval. Minimum Overall GPA 2.5. Minimum grade of B in upper division Human Ecology course. Supervised practical experience in a variety of professional settings.

See the HEC 4990 Internship Manual, Additional Information Section, regarding criteria including student eligibility, responsibilities and work requirements for HEC Internships and Field Experiences.

Child Development and Family Relations

HEC 2200. Development of Young Children: Conception to Age 6.

Lec. 3. Credit 3.

Basic principles and theories of child development from conception to age six, with emphasis on hereditary and environmental factors influencing development, and the importance of developmentally appropriate practices. Course includes approximately 8-10 hours of case study with a child below the age of six.

HEC 2510. Creative Play.

Lec. 2. Lab. 1. Credit 3.

Prerequisite: HEC 1010 or HEC 2200. Emphasis on the importance of play as related to developmental levels of young children (birth-9 years old) and to appropriate settings.

HEC 3066. Family Violence across the Lifespan.

Lec. 3. Credit 3.

Prerequisite: HEC 2065 or approval of instructor. A comprehensive review of family violence, abuse and maltreatment across the lifespan using a systems/ecological perspective.

HEC 3500. Development: Middle Childhood/Adolescence.

Lec. 3. Credit 3.

Basic principles of physical, cognitive, and psychosocial development in middle childhood and adolescence; ages six through eighteen. Addresses factors that contribute to challenges in middle childhood and adolescent development.

HEC 3520. Parent Education and Child Guidance.

Lec. 2. Credit 2.

Prerequisite: HEC 2200 with a grade of C or better. Parental involvement in the education of children; communication, decision-making, and the learning-valuing process.

HEC 3660. Interpersonal Relationships.

Lec. 3. Credit 3.

Prerequisite: HEC 2060 or HEC 2065. An in-depth exploration into the diverse and multidisciplinary field of interpersonal relationships.

HEC 3700. Development: Young Adulthood/Aging.

Lec. 3. Credit 3.

Prerequisite: HEC Major/Junior or Senior classification. Development and change from young adulthood through aging. Programs serving adults and the aging population.

HEC 4065. Social Policy for Children and Families.

Lec. 3. Credit 3.

Prerequisite: HEC 2065. An understanding of the legal issues, policies and laws influencing the well-being of children and families.

HEC 4600. Theories in Family Development and Relationships.

Lec. 3. Credit 3.

Prerequisite: HEC Major/Junior or Senior classification. Examination of existing theoretical frameworks to provide a context for understanding contemporary families in the complex social world. Family development and relationships, diversity in contemporary settings is emphasized; application of a framework in analysis of interaction and the dynamics of families.

HEC 4610. Families: Normative/Catastrophic Issues.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior standing; HEC 2065. In depth study of family stress and effective coping mechanisms that relate to normative transitions and crisis events.

HEC 4630. Family Life Education.

Lec. 3. Credit 3.

Prerequisite: HEC 2060 or HEC 2065; Junior or Senior standing in Human Ecology. An understanding of the general philosophy and broad principles of family life education in conjunction with the ability to plan, implement, and evaluate such educational programs.

HEC 4910. Internship in Child Development and Family Relations.

Credit 6, 8, 12.

Prerequisites: Department approval. Minimum Overall GPA 2.75. Minimum overall GPA of 3.0 in Human Ecology courses. Approval of advisor to include: analysis of coursework, application, and placement at facility. Supervised practical experience in a variety of professional settings.

Child Life**HEC 2250. Child Life Theory and Practice.**

Lec. 3. Credit 3.

Introduction to the field of child life, the role of the child life specialist in healthcare, theory, professional practices, overview of Child Life Council and certification process. Course is taught by a Certified Child Life Specialist.

HEC 2550. Children in Health Care.

Lec. 3. Credit 3.

Explore children and families' experiences and reactions to healthcare encounters. Meeting children and families psychosocial needs during healthcare experiences.

HEC 3550. Child Life Assessment of Children and Families.

Lec. 3. Credit 3.

Prerequisite: HEC 2250 and HEC 2550. Child Life assessment techniques for children and families in healthcare including groups of children, signs of stress, and documentation of assessment.

HEC 3560. Child Life Intervention Strategies.

Lec. 2. Lab. 1. Credit 3.

Prerequisite: HEC 3550. Child Life clinical and play interventions to meet the needs of children and families during health care experiences.

HEC 3565. End of Life Application for Children & Families.

Lec. 3. Credit 3.

Prerequisite: HEC 2065 and HEC 2200; Junior or Senior standing. End of life topics including loss, death, grief, and bereavement with focused application on children and families. Developmentally based psychosocial care.

HEC 3570. Child Life Practicum.

Credit 1.

Prerequisite or corequisite: HEC 3560. Applied service learning experience with children and families in a healthcare setting.

HEC 3591. Introduction to Child Life Clinical Experience.

Lec. 2. Credit 2.

Corequisite: HEC 3550. Preparation for child life practicum and clinical experience including application deadlines and process, on-site or phone interviews, content areas to discuss, and communicating for success in earning a service learning placement in a pediatric health care setting. Emphasis on internship and practicum expectations set by Child Life Council.

HEC 4550. Research Methods and Professional Aspects of Child Life.

Lec. 3. Credit 3.

Prerequisite: HEC 3560. Professionalism, program development including administration, and various roles of supervision within the field of Child Life in preparation

for a Child Life internship and the national certification exam.

HEC 4590. Clinical Child Life Experience.

Credit 12.

Prerequisite: Senior standing, HEC 3570 and HEC 4550. Supervised work experience in a pediatric health care facility to develop clinical child life skills. Direct supervision by a Certified Child Life Specialist in good standing with the Child Life Council is required. In order to meet the Child Life Council eligibility requirements to sit for the Child Life Certification Exam, the Child Life Internship experience must be a minimum of 480 clock hours.

Family and Consumer Sciences Education**HEC 2800. Introduction to Teaching Family and Consumer Sciences.**

Lec. 2. Lab. 2. Credit 3.

Responsibilities of the family and consumer sciences teacher in the secondary school. Includes observation and participation in local schools.

HEC 3100. Intercultural Competence.

Lec. 3. Credit 3.

Importance of intercultural competence in order to facilitate tolerance across different cultures and connect across diverse cultures.

HEC 3805. Materials and Methods of Teaching Family and Consumer Sciences Education.

Lec. 3. Credit 3.

Prerequisite: Admission to the Teacher Education Program and 20 hours of Human Ecology courses. Selection, use and evaluation of learning experiences and materials, programming planning. Information regarding occupational licensure.

HEC 3812. Practicum in Family and Consumer Sciences.

Lab. 4. Credit 2.

Prerequisite or corequisite: HEC 3805. Observation and supervised teaching and participation in Family and Consumer Sciences Educational settings.

HEC 3841. Occupational Family and Consumer Sciences.

Lec. 2. Credit 1.

Prerequisite: HEC 2800. Organization and operation of Occupational Family and Consumer Sciences Programs at high school and adult levels.

HEC 4871. Residency I.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: HEC 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and

others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

HEC 4872. Professional Seminar I. Credit 5.
Corequisite: Full admission to the Teacher Education Program. Corequisite: HEC 4871. Residency I candidates will develop engaging strategies that support and meet the needs of all learners. Candidates will identify and learn to implement engaging strategies related to students' developmental, cultural and socioeconomic factors.

HEC 4881. Residency II. Credit 10.
Prerequisite: Full admission to the Teacher Education Program. HEC 4871 with a grade of B. Corequisite: HEC 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

HEC 4882. Professional Seminar II. Credit 2.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: HEC 4881. Seminar for Residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

Food Systems Administration

HEC (AGRN) 3610. Food Safety in Agritourism – Planning. Lec. 2. Lab. 1. Credit 3.
Introductory course in food safety as applied to the planning, production, and processing of cool season crops using experiential learning techniques. Food and farm safety regulations as related to the Agritourism industry. Students earn pesticide handler certification.

HEC (AGRN) 3620. Food Safety in Agritourism - Growing and Harvesting. Lec. 2. Lab. 1. Credit 3.
Prerequisite: HEC 3610. Further application of food and farm principles and regulations, with emphasis on planning, production, and processing of warm season crops. Students participate in dissemination of raw and processed products in various Agritourism settings.

HEC (AGRN) 3630. Food Safety in Agritourism – Post-Harvest. Lec. 2. Lab 1. Credit 3.
Prerequisite: HEC 3620. Emphasis on post-harvest handling and storage of crops. Safe processing of agricultural products using traditional

techniques. Students will demonstrate processing techniques in a variety of Agritourism settings.

HEC 4254. Field Experience in School Nutrition. Credit 6.
Prerequisite: HEC 3240 and HEC 4242. Supervised work experience in a school nutrition setting.

HEC 4993. Field Experience--Environmental Health Science. Credit 6.
Prerequisite: HEC 4242, HEC Major and Senior Standing. Supervised work experience with an Environmental Health Science professional for application of sanitation, inspection, disease control, and quality control skills. Course may be repeated one time.

HEC 4995. Field Experience—Food Systems. Credit 6.
Prerequisite: HEC 4242, HEC Major and Senior Standing. Supervised work experience in a food related organization for application of food service, inspection, or quality control skills. Course may be repeated one time.

Housing and Design

HEC 2411. Practicum: Housing and Design. Credit 1.
Prerequisite: Departmental approval. Applied service learning and work experience in a housing and design setting.

HEC 2421. Architectural Graphics and Presentation Techniques. Lec. 2. Lab. 2. Credit 3.
Prerequisite: HEC 2041. Basic architectural drafting including graphics and symbols for residential floor plans and light construction.

HEC 2431. Residential Design I. Lec. 2. Lab. 2. Credit 3.
Prerequisite: Grade of C or better in HEC 2421. Fundamental execution of residential design problems including perspectives, floor plans and renderings using both hand and computer techniques.

HEC 2440. Computer Aided Design of Residences. Lec. 1. Lab. 4. Credit 3.
Prerequisite: HEC 2421. An introduction to concepts and methods of computer-aided design in residences.

HEC 2460. Interior Architecture Codes and Standards. Lec. 2. Credit 2.
Prerequisite: HEC 2421. Survey of interior architecture codes and standards including their application and implementation as required by law.

HEC 3431. Residential Design II.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Grade of C or better in HEC 2431. Space planning of residences with emphasis on presentations through floor plans, elevations, perspectives, and sample boards.

HEC 4450. Commercial Design.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Three credits in Math, COMM 2025, HEC 2440, and grade of C or better in HEC 3431. Various media for planning and rendering interior spaces for the commercial environment. Portfolio preparation and visual developmental skills are attained. Submission of resume and portfolio.

HEC 4460. Historical and Contemporary Architecture and Furnishings.

Lec. 3. Credit 3

Prerequisite: HEC 2041. Overview of architecture, interior design, and furnishings from Ancient Egyptian period to present.

Merchandising and Design

HEC 1100. Design Concepts of Dress.

Lec. 2. Credit 2.

Exploration of how design elements and principles influence design, both theoretically and practically.

HEC 1150. Analysis of Apparel and Furnishings.

Lec. 3. Credit 3.

Prerequisite: HEC 1100. Study and evaluation of apparel and home furnishing products used by individuals and families.

HEC 2300. Tailoring.

Lec. 1. Lab. 4. Credit 3.

Prerequisite: HEC 2355. Evaluation and use of tailoring techniques in the selection, fitting, and construction of garments.

HEC 2311. Practicum: Merchandising and Design.

Credit 1.

Prerequisite: Departmental approval. Work experience in a fashion merchandising setting.

HEC 2355. Clothing Construction.

Lec. 1. Lab. 4. Credit 3.

Prerequisite: Minimum grade of C in HEC 1100 and HEC 1150. Theories of apparel construction, principles of fitting, and their application to garment construction

HEC 3300. Flat Pattern.

Lec. 1. Lab. 4. Credit 3.

Prerequisite: HEC 2355. Apparel design from sketching to pattern making to garment completion.

HEC 3310. Textiles I.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Grade of C or better MATH 1010 or MATH

1130 or MATH 1530, CHEM 1010, CHEM 1020. Fibers, yarns, fabrics, finishes, and applied design related to the selection, evaluation, use and care of textile products.

HEC 3320. Textiles II.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Grade of C or better in HEC 3310.

Problems involving fiber and fabric identification, textile performance, end-use and care, legislation and standardization in the textile/apparel industry.

HEC 3350. Merchandising I.

Lec. 3. Credit 3.

Prerequisite: HEC 2031. Introduction to the merchandising of apparel and home furnishing products.

HEC 4300. Draping.

Lec. 1. Lab. 4. Credit 3.

Discovery and application of draping techniques for apparel design and pattern making.

HEC 4301. Computer Aided Apparel Design.

Lec. 1. Lab. 4. Credit 3.

Development and application of garment design and construction techniques using CAD software.

HEC 4315. Global Social Responsibility.

Lec. 3. Credit 3.

Introspective examination of current issues of social responsibility in a global economy, with an emphasis placed on fair labor practices, child labor laws, and sustainability.

HEC 4320. Merchandise Promotion and Advertising.

Lec. 3. Credit 3.

Prerequisite: HEC 3350. Communication of product information through special promotions and advertisements.

HEC 4340. History of Dress.

Lec. 3. Credit 3.

Prerequisite: HEC 2031. Study of dress and adornment from ancient times to present day.

HEC 4360. Merchandising II.

Lec. 3. Credit 3.

Prerequisite: HEC 3350 and MATH 1010. Principles of merchandising including merchandise planning and decision making. Emphasis on the role of the buyer in case studies.

Nutrition and Dietetics

HEC 2220. Medical Terminology for the Human Sciences.

Credit 1.

Prerequisite: Anatomy & Physiology course. This course provides students with an understanding of the terminology used in health care and wellness programs.

HEC 2240. Food Preparation and Management.

Lec. 2. Lab. 4. Credit 4.

Prerequisite or corequisite: HEC 1030 or HEC 2020.

Scientific principles of food preparation and management including standard techniques, nutrient retention, menu planning, food purchasing, and meal service.

HEC 2611. Sports Nutrition Practicum.

Credit 1, 2, 3.

Prerequisite: HEC 1030 or HEC 2020. Consent of instructor. Application of sports nutrition principles in an applied setting.

HEC 3201. Community Nutrition.

Lec. 3. Credit 3.

Prerequisite: HEC 1030 or HEC 2020. Cultural food patterns; nutrition education assessment, implementation, and evaluation of community needs at local level; and the study of delivery systems of nutrition services at the local, state, federal, and international levels.

HEC 3240. Quantity Food Production.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: HEC 2240 and three semester hours of math. Management and preparation of quality food in quantity, menu planning, recipe standardization, procurement, safety, sanitation, and food costing.

HEC 3270. Nutrition in Disease.

Lec. 3. Credit 3.

Prerequisite: Grade of C or better in HEC 2020 and BIOL 2350 and admission to the HEC-DPD program. Principles of clinical nutrition relative to prevention and treatment of disease with dietary modifications.

HEC 3290. Nutrition through the Life Cycle.

Lec. 3 Credit 3.

Prerequisite: HEC 1030 or HEC 2020. Nutrition needs throughout the life cycle, from preconception through the end of life. Review of nutrient and energy needs, assessment of nutritional status and consequences of inadequate nutrition at each stage of life.

HEC 4200. Advanced Nutrition.

Lec. 3. Credit 3.

Prerequisite: HEC 2020, CHEM 3005, BIOL 2350 admission to the HEC-DPD program. Interrelationships of nutrients in metabolism at the cellular level. Current issues in nutrition.

HEC 4220. Research in Food Science and Nutrition.

Credit 2.

Prerequisite: Departmental approval. Independent work for students with special ability. May be repeated for a total of six credits when content varies.

HEC 4242. Food Systems Administration.

Lec. 3. Credit 3.

Prerequisite: HEC 2240 and HEC 3240. Systems approach to food service management; facilities,

financial, personnel, equipment, and legal issues in food service.

HEC 4271. Medical Nutrition Therapy.

Lec. 3. Credit 3.

Prerequisite: HEC 3270. Prerequisite or corequisite: HEC 4200 (5200). Medical nutrition therapy and nutritional status assessment.

HEC 4272. Clinical Dietetics.

Lec. 3. Credit 3.

Prerequisite: HEC 4200, HEC 4271, HEC Major and Senior Standing. Application of medical nutrition therapy in a supervised environment and practice setting.

HEC 4925. Nutrition Counseling and Education.

Lec. 3. Credit 3.

Prerequisite: HEC 2020, HEC 3270. Identification and application of key communication principles used for nutrition counseling and education in a variety of settings and for diverse populations.

HEC 4940. Nutrition, Fitness and Wellness.

Lec. 2. Credit 2.

Prerequisite: HEC 1030 or HEC 2020. Basic principles of wellness promotion through exercise and nutrition: assessment and intervention strategies are included.

HEC 4994. Field Experience—Health Care.

Credit 3.

Prerequisite: HEC 4242, HEC 4272 and Senior Standing. Supervised work experience in a health care facility to develop medical nutrition therapy skills. Course may be repeated one time.

Instructional Leadership (INSL)

INSL 4280. Legal Aspects.

Lec. 1. Credit 1.

Special topics concerning school law and legal issues in education presented in workshop and seminar formats. Students may repeat the course for credit for a maximum of three credit hours.

Interdisciplinary Studies (LIST)

LIST 1000. FLS International Course.

Lec. 1. Credit 1.

Prerequisite: LIST 1000 is created for the FLS Core Courses offered in nine levels of proficiency. In the core course, students learn the skills of speaking, listening, reading and writing in an integrated manner. LIST 1000 is reserved for participants in the Intensive English Language Program and is not intended for degree seeking students. Credits may not be applied to a degree program. May be repeated up to 6 times.

LIST 1090. FLS International Course.

Lec. 1. Credit 1.

LIST 1090 is created for the FLS Core Courses offered

in nine levels of proficiency. In the core course, students learn the skills of speaking, listening, reading and writing in an integrated manner. LIST 1090 is reserved for participants in the Intensive English Language Program and is not intended for degree seeking students. **Credits may not be applied to a degree program.** May be repeated up to 6 times.

LIST 1091. Special Topics. Credit 1.
Consent of advisor and Dean of Interdisciplinary Studies.

LIST 1092. Special Topics. Credit 2.
Consent of advisor and Dean of Interdisciplinary Studies.

LIST 1093. Special Topics. Credit 3.
Consent of advisor and Dean of Interdisciplinary Studies.

LIST 2091. Service Learning. Lec. 1. Credit 1.
This course provides students the opportunity to engage in a Service Learning Project within the community. Students will have the opportunity to complete twenty service hours at a not for profit organizations, while gaining work experience for the future. In addition to the service hours, students are required to read a textbook related to service learning, complete journal entries, and write reflective essays relating to the work experiences to the text.

LIST 2093. Service Learning. Lec. 3. Credit 3.
This course provides students the opportunity to engage in a Service Learning Project within the community. Students will have the opportunity to complete sixty service hours at a not for profit organizations, while gaining work experience for the future. In addition to the service hours, students are required to read a text book related to service learning, complete journal entries, and write reflective essays relating to the work experiences to the text.

LIST 2300. Academic and Community Connections. Lec. 1. Credit 1.
The purpose of this course is to introduce students to concepts and practices that positively affect academic and community engagement. Understanding that the student athlete experience has some unique aspects, the course emphasize the tools and practices that can positively affect this experience. The course will include both in-class sessions led by various presenters, and an outside-of-class service-learning component. May be repeated up to 4 times.

LIST 2880. Credit for Prior Learning. Credit 1-12.
Prior learning credit for college-level, credit-worthy learning attained outside of a higher-education context. Credit is earned through a portfolio assessment: students may submit a learning portfolio to the College

of Interdisciplinary Studies that is assessed by a multidisciplinary faculty assessment team. LIST 2880 credit is at the lower division level.

LIST 3030. Service Learning. Lec. 3. Credit 3.
This course provides students the opportunity to engage in a Service Learning Project within the community. Students will have the opportunity to complete sixty service hours at a not for profit organizations, while gaining work experience for the future. In addition to the service hours, students are required to read a text book related to service learning, complete journal entries, write reflective essays relating the work experiences to the text, and compile an annotated bibliography relating research articles to the text.

LIST 3100. Critical Thinking and Problem Solving. Lec. 3. Credit 3.
The purpose of this course is to introduce students to basic approaches to problem solving, and apply those approaches to real-world problems. Topics will be covered utilizing a variety of teaching methods: lecture/discussion, cooperative learning/group problem solving, projects, and individual problem solving exercises.

LIST 3210. Youth Studies. Lec. 3. Credit 3.
The course will examine theories of factors associated with positive and negative outcomes in children and adolescents. Special attention will be given to resilience factors that help overcome adversity. Students will be able to explain and implement best practices in intervening to enhance the development of positive outcomes for children and adolescents.

LIST 3220. Intimate Relationships. Lec. 3. Credit 3.
The course will examine the social, cognitive, emotional, and physical factors of intimate relationships. The attachment relationships examined will range from parent-child bonds to friendships to marriage. Emphasis will be placed on sexuality, and students will be able to understand the physiological components of sexual expression as well as be able to articulately and respectfully discuss competing historic and contemporary social views related to intimate relationships.

LIST 3300. Workplace Etiquette. Lec. 3. Credit 3.
The purpose of this course is to introduce students to professional skills and conduct that will help in job acquisition and advancement.

LIST 3410. Team Building and Workplace Dynamics.

Lec. 3. Credit 3.

The purpose of this course is to better understand the function of teams in workplace settings. Emphasis will be placed on applying theory to practice.

LIST 3500. Non Profit Leadership. Lec. 3. Credit 3.

This course is designed to provide an introduction to nonprofit organizations and the roles they play in society, as well as the various elements involved in non-profit leadership and governance.

LIST 3880. Credit for Prior Learning. Credit 1-12.

Prior learning credit for college-level, credit-worthy learning attained outside of a higher-education context. Credit is earned through a portfolio assessment: students may submit a learning portfolio to the College of Interdisciplinary Studies that is assessed by a multidisciplinary faculty assessment team. LIST 3880 credit is at the upper division level.

LIST 4041, 4042, 4043. Directed Studies.

Indep. St. 1, 2, 3. Credit 1, 2, 3.

Prerequisite: Consent of the instructor. Individualized directed studies where there is no appropriate course offering, under the supervision of a faculty mentor. Students may take up to 6 hours of Directed Studies, with different topics.

LIST (SPED) 4050. Sign Language I.

Lec. 3. Credit 3.

Introduction to and development of a basic vocabulary in Signed English concepts in the use of alternative methods of communication.

LIST (SPED) 4090. Sign Language II.

Lec. 3. Credit 3.

Prerequisite: LIST 4050. Continuation of vocabulary development in Signed English and appreciation of practical situations in various professional fields.

LIST 4093. Special Topics. Credit 1, 2, 3.

Upper Division level study in a specific topic not commonly found in a discipline on campus, not to include work experience. May be repeated if topic is different. No more than a combined total of 9 hours of LIST 4091, 4092, and 4093 may be used for degree.

LIST 4100. Adult Learning. Lec. 3. Credit 3.

Prerequisite: Junior and Senior status is recommended. Introduction to principles of adult learning and the application of these principles to teaching, training, and personal development.

LIST 4113. PRST/LIST Internship.

Lec. 3. Credit 3.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee. Class may be taken twice for a total of (6) credit hours. Interdisciplinary Studies majors may take up to (6) credit hours of internship.

LIST 4114. PRST/LIST Internship.

Lec. 4. Credit 4.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee. Class may be taken twice for a total of (6) credit hours. Interdisciplinary Studies majors may take up to (6) credit hours of internship.

LIST 4115. PRST/LIST Internship.

Lec. 5. Credit 5.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee. Class may be taken twice for a total of (6) credit hours. Interdisciplinary Studies majors may take up to (6) credit hours of internship.

LIST 4116. PRST/LIST Internship.

Lec. 6. Credit 6.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee. Class may be taken twice for a total of (6) credit hours. Interdisciplinary Studies majors may take up to (6) credit hours of internship.

LIST 4200. Professional and Personal Integrity.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior status or permission of the instructor. Participants will explore methods for promoting personal and social wholeness. Based on the notion that a healthy society flows from healthy individuals, and by examining historical case studies and contemporary literature, the course will help students

maximize personal potential by learning effective management of emotions, commitment to justice, and promoting behavior rooted in wisdom, kindness, and courage.

LIST 4300. Workplace Performance.

Lec. 3. Credit 3.

Prerequisite: Junior or Senior status or permission of the instructor. The purpose of this course is to introduce students to Industrial Management and the theories that inform management in the workplace. Topics will be covered utilizing a variety of teaching methods: lecture/discussion, cooperative learning/group problem solving, projects, and individual problem solving exercises.

LIST 4440-4449. Workshop.

Lec 1. Credit 1.

Workshop developed around a central theme. May be repeated with a different topic.

LIST 4850. Topics in Organizational Development.

Credit 3.

Concentration on a topic in Organization Development. May be repeated with different topics. No more than a total of nine hours of LIST 4850 may be used for degree.

LIST 4921, 4922. Special Topics.

Lec 1, 2. Credit 1, 2.

Seminar or lecture course on a selected topic, issue, or interest area. Students may take up to 9 hours of 4921, 4922, 4923 combined, if they are different topics.

LIST 4923-4929. Special Topics.

Lec. 3. Credit 3.

Seminar or lecture course on a selected topic, issue, or interest area. Students may take up to 9 hours of 4921-4929 combined, if they are different topics.

LIST (PRST) 4995. Capstone Project.

Lec. 3. Credit 3.

Prerequisite: Permission of instructor. Academic research or other creative activity resulting in a tangible product to demonstrate synthesis of student's coursework. This course is required for all PRST and LIST majors.

International Business and Cultures (IBC)

IBC 4980. Practicum.

Credit 3-10.

Prerequisite: Junior or Senior standing and consent of advisor. Semester-long, practical experience with international trade or commerce. Credit assigned by advisor and monitored by the IBC Executive Committee.

IBC 4990. International Experience.

Lec. 3. Credit 3.

IBC 4990 develops students' understanding and

knowledge of business practices in a foreign nation(s). Topics covered include social and cultural differences, national and regional political forces that influence business practices, and the internal economic environment and its impact on marketing, finance, organizational structure, and operations of businesses in the host country (countries).

Journalism (JOUR)

(O) and (E) Denote Odd and Even Years Respectively

JOUR 2100. Media Literacy and Society.

Lec. 3. Credit 3.

This course will explore the historical development and current status of mass media from a consumer's point of view with the goal of improving media literacy skills. Topics relate to the construction and deconstruction of media messages and how they influence individuals, specialized and mass audiences, and society as a whole. Students develop global perspectives by encountering issues dealing with the relationship of the media to government, education, society, politics, economics, religion, culture, family, and the individual as well as the role and responsibility of a free press in a democratic society.

JOUR 2200. Mass Communication in a Changing Society.

Lec. 3. Credit 3.

Mass communications in a democracy. Trends in media, the government as friend and foe, legal problems, and the invasion of privacy. May include experience on the student media. **(COMM 1010, TTP Course)**

JOUR 2220. News Reporting and Copy Editing.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200. Basics of gathering and writing news. Introduction to copy editing and the Associated Press Stylebook. May include experiences on the student media.

JOUR 3350. Newspaper Production and Design.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200. Typography and current trends in newspaper production and design.

JOUR 3370. Fundamentals of Photojournalism.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200. An introduction to the technical, aesthetic and ethical aspects of digital photography with an emphasis on photojournalism and visual storytelling.

JOUR 3400. Introduction to Broadcast Journalism.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200 and JOUR 2220. Electronic

media with emphasis on news writing for radio and television. May include experience on the campus radio.

JOUR 3460. Introduction to Public Relations.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200. Career opportunities in public relations. Historical, philosophical, and ethical aspects.

JOUR 3470. Public Relations Writing.

Lec. 3. Credit 3.

Prerequisites: JOUR 2200, JOUR 2220 and JOUR 3460. Public relations writing and publications. This course will examine how public relations practitioners effectively tailor messages to reach specific audiences with intended messages using various media.

JOUR 3500. Multimedia Storytelling. Lec. 3. Credit 3

Prerequisite: JOUR 2200 or JOUR 2220. An introductory course in multimedia tools for online content creation. Photography, audio, and video will be used for compelling reporting.

JOUR 3740. Advertising Copy and Layout.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200. Advertising in current publications with emphasis on trends in copy and layout.

JOUR 3750. History of Journalism.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200. The history of the press from colonial times to the present. Emphasis on major trends, persons, events.

JOUR 3770. Law of Journalism. Lec. 3. Credit 3.

Prerequisite: JOUR 2200. The law of the press from colonial times to the present.

JOUR 4360 (5360). Magazine Production and Design.-Spring.

Lec. 3. Credit 3.

Current trends in magazine production and design.

JOUR 4460 (5460). Public Relations--Cases and Practices.

Lec. 3. Credit 3.

Prerequisite: JOUR 3460 and either JOUR 3350 or JOUR 4360 (5360). Practical aspects of public relations emphasized. Case studies considered. Builds on knowledge and expertise acquired in JOUR 3460.

JOUR 4500. Advanced Multimedia Storytelling.

Lec. 3. Credit 3.

Prerequisite: JOUR 2200, JOUR 2220, a "C" or higher in JOUR 3500, or consent of instructor. A fast-paced course in content creation for the web and broadcast. May include experience on student media outlets. Associated Press style will be used.

JOUR 4710. Literary Journalism. Lec. 3. Credit 3.

Prerequisite: ENGL 1020 and JOUR 2220. Instruction in the form of the literary essay--both short and book length--through both reading and writing literary essays. Course may be repeated for credit provided content is different.

JOUR 4820 (5820). Advanced Reporting.

Lec. 3. Credit 3.

Prerequisite: JOUR 2220. Writing and reporting for the commercial media. Students may serve as reporters for the campus newspaper.

JOUR 4830 (5830). Feature Writing.-Spring.

Lec. 3. Credit 3.

Prerequisite: JOUR 2220. Recommended: JOUR 4820 (5820). Writing and marketing of feature stories, commentaries, and articles.

JOUR 4843 (5843). Special Problems. Credit 3.

Prerequisite: JOUR 2200; Senior Standing or consent of instructor. Independent work in mass media research and/or writing related to student academic and career goals.

JOUR 4846 (5846). Special Problems. Credit 6.

Prerequisite: JOUR 2200; Senior Standing or consent of instructor. Independent work in mass media research and/or writing related to student academic and career goals.

JOUR 4849 (5849). Special Problems. Credit 9.

Prerequisite: JOUR 2200; Senior Standing or consent of instructor. Independent work in mass media research and/or writing related to student academic and career goals.

JOUR 4853 (5853). Internship. Credit 3.

Prerequisite: JOUR 2200. Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

JOUR 4856 (5856). Internship. Credit 6.

Prerequisite: JOUR 2200. Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

JOUR 4859 (5859). Internship. Credit 9.

Prerequisite: JOUR 2200. Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

JOUR 4930 (5930). Advanced Copy Editing.

Lec. 3. Credit 3.

Prerequisite: JOUR 2220. Additional training in editing copy. Laboratory work may be required on the university student newspaper.

Library Science (LSCI)

LSCI 4000 (5000). Information Sources.

Lec. 2. Credit 2.

Selection, evaluation, and use of standard and current information sources for teachers, librarians, and children.

LSCI (READ) 4020 (5020). Storytelling and Traditional Literature.

Lec. 3. Credit 3.

Storytelling techniques and literature presentation through storytelling.

LSCI 4400 (5400). Audio-Visual Aids to Teaching.

Lec. 2. Credit 2.

Prerequisite: EDPY 2210. Survey of educational media available to educators with emphasis given to effective utilization.

LSCI (ECED) 4530 (5530). Books and Related Materials for Infants and Toddlers.

Lec. 1. Credit 1.

Survey of developmentally appropriate books and materials for infants and toddlers.

LSCI (READ) 4540 (5540). Multiethnic Literature for Infants, Toddlers and Preschoolers.

Lec. 1. Credit 1.

Introduction to preschool trade books and related materials reflecting an understanding of multiethnicity.

LSCI (READ) 4550 (5550). Multiethnic Literature for Children.

Lec. 1. Credit 1.

Introduction to children's trade books and related materials reflecting an understanding of multiethnicity.

LSCI (READ) 4560 (5560). Multiethnic Literature for Adolescents and Adults.

Lec. 1. Credit 1.

Introduction to adolescent and adult trade books and related materials reflecting an understanding of multiethnicity.

LSCI (READ) 4570 (5570). Young Adult Literature.

Lec. 3. Credit 3.

Survey of books and materials for middle level, high school students, and adults focusing on techniques to assist in reading these materials with understanding.

Linguistics (LING)

LING (ENGL) 4511 (5511). Introduction to Descriptive Linguistics.

Lec. 3. Credit 3.

Introduction to descriptive analysis of language: phonology, morphology, lexicon, and syntax.

LING (ENGL) 4521 (5521). History of the English Language.

Lec. 3. Credit 3.

History of the language from its origins to the present; emphasis upon historical development of English sounds, word structure, and syntax.

LING (ENGL) 4531 (5531). Grammar and Language.

Lec. 3. Credit 3.

Grammatical structure of English in relation to dialect and register with some emphasis on historical and potential changes in grammar.

LING (ENGL) 4541 (5541). Topics in Linguistics/Language.

Lec. 3. Credit 3.

Examination of specific aspects of language and/or linguistic study, such as Old and Middle English, the language of dialect literature or American English dialects. Course may be repeated provided the content is different each time.

ENGL (LING) 4561 (5561). American English.

Lec. 3. Credit 3.

This class will examine American English from multiple cultural and linguistic angles and allow the students to develop their own understanding of how the language around them shapes their lives.

Manufacturing and Engineering Technology (MET)

MET 1100. Introduction to Manufacturing Engineering Technology.

Lec. 1. Lab. 2. Credit 2.

Introduction to the materials and processes used in the manufacturing of metals, ceramics, polymers, composites and wood products.

MET 1835. Applications of Math in Engineering Technology Lab.

Lab. 2. Credit 1.

Prerequisite: MATH 1910 or MATH 1845. Use of integral and differential calculus with numerical applications for engineering technology.

MET 2000. Occupational Safety.

Lec. 2. Credit 2.

Occupational safety and health hazards associated with man-machine systems with emphasis on recognition, evaluation, and control of such hazards.

MET 2065. Metal Manufacturing Technology.

Lec. 1. Lab. 3. Credit 2.

Prerequisite: ENGR 1110, MET 1100 and MATH 1730.

Machine tool functions, use of hand tools, precision measurement, welding and fabrication of metals.

MET 2310. Applied Fluid Power. Lec. 2. Credit 2.
Prerequisite: MATH 1730. This course covers the basics of pneumatic, electro-pneumatic and hydraulic control circuits in automated system.

MET 2400. Statics and Strength of Materials. Lec. 2. Lab. 2. Credit 3.
Prerequisite: MATH 1730 and PHYS 2010. This course is an introduction to concurrent force analyses, stresses, strains and combined stresses in structures and machines components.

MET 2640. Aviation Ground Instruction I. Lec. 3. Credit 3.
Basic theory and principles of flight, aircraft systems, and material for instruments. Completion of Ground School Certification Examination.

MET 2650. Aviation Flight Instruction. Lec. 1. Lab. 4. Credit 3.
Prerequisite: MET 2640. This course will cover only the aeronautical knowledge and skills necessary to meet the requirements of a Private Pilot FAA Certificate. To meet FAA flight requirements, students should arrange and pay for their own flight lessons.

MET 3000. Principles of Metal Casting. Lec. 1. Lab. 2. Credit 2.
Prerequisite: ENGR 1110, MET 1100, and ME 3110 or MET 3100. Corequisite: ME 3110 or MET 3100.
Principles of molding and casting aluminum, bronze and gray iron. Use of cores, patterns and machine molding included.

MET 3060. Computer Numerical Control Machining Practices. Lec. 2. Lab. 3. Credit 3.
Prerequisite: MET 2063. Theory of numerical control equipment and programming for machine setup and operation of CNC milling and turning equipment.

MET 3080. Plastics Processing and Applications. Lec. 2. Lab. 2. Credit 3.
Prerequisite: Junior Standing and CHEM 1010. Studies in the use of plastic-related products with laboratory activities.

MET 3100. Applied Physical Metallurgy. Lec. 2. Lab. 2. Credit 3.
Prerequisites: MET 1100, CHEM 1010 or CHEM 1110. A study of the relationships between chemical compositions and structures on the properties of ferrous, non-ferrous metals and alloys used in manufacturing industry.

MET 3150. Maintenance Technology I. Lec. 2. Credit 2.
Prerequisite: Junior Standing and MET 1100. Principles of organizing and controlling maintenance operations in industrial plants.

MET 3200. Applied Electricity and Electronics. Lec. 2. Lab. 2. Credit 3.
Prerequisite: MATH 1845. Corequisite: PHYS 2020. Fundamentals of electricity and electronics, basic circuits, motors, generators and power distribution, advanced electronic circuits, semiconductors and power supplies, electronic communication, and data systems.

MET 3260. Industrial Electronics. Lec. 2. Lab. 2. Credit 3.
Prerequisite: MET 3200 or departmental approval. The fundamentals of process control, transducers, signal processing, feedback loops, activators, and analog and digital controllers.

MET 3301. CAD for Technology. Lec. 1. Lab. 2. Credit 2.
Prerequisite: ENGR 1110. CAD techniques for industrial applications with laboratory experiences.

MET 3403. Applied Machine Elements. Lec. 2. Lab. 2. Credit 3.
Prerequisite: MET 2400 and MET 3301. Corequisite: ME 3110 or MET 3100. Static and dynamic properties of materials. Principles of machine elements calculations, components selection, assembly, and lubrication.

MET 3460. Welding Technology. Lec. 1. Lab. 2. Credit 2.
Prerequisite: Junior Standing. Welding materials using current welding processes and techniques.

MET 3560. Advanced Welding. Lec. 2. Lab. 2. Credit 3.
Prerequisite: MET 2063.

MET 3700. Manufacturing Cost Estimating. Lec. 2. Credit 2.
Prerequisite: Junior Standing and MET 1100. This is an experiential learning course where the students participate in solving an industrial problem. This course requires the application of computer-aided design, bill of materials, manufacturing processes, process design, writing a report, and presentation of the results.

MET 3710. Methods Design and Work Measurement. Lec. 2. Credit 2.
Prerequisite: Junior Standing and MET 1100. Introduction to concepts and the practice of methods improvement and work measurement for lean manufacturing.

MET 3740. Six Sigma Tools and Techniques.

Lec. 2. Credit 2.

Using Lean Six Sigma tools and techniques for enabling optimal performance in service industries including healthcare and distribution, manufacturing companies, and government.

MET 4000 (5000). Advanced Foundry Technology.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3000. Study of advanced foundry processes, gating system design, die/pattern design and mechanization of foundry. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4060 (5060). CNC Concepts, Advanced Techniques & Applications.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3060 or departmental approval. An in-depth study of programming systems, techniques and applications. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4210 (5210). Programmable Logic Controllers and Process Control.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3260 or departmental approval. Programmable logic controllers (PLC's) and automated process control; design and implementation of an automatic controlled industrial process. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4220 (5220). Industrial Automation and Robotics.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3200 or departmental approval. Studies in the theory and application of industrial automation relating to Manufacturing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4250 (5250). Applied Mechatronics.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3260 or consent of instructor. Introduction to mechatronic systems; modeling of mixed mechatronic systems; microcontroller programming and interfacing; theory, selection and implementation of sensors and actuators commonly used in mechatronic systems; control architectures and case studies in mechatronic systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4300 (5300). Advanced CAD Techniques.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3301 or departmental approval. An in-

depth course using CAD as a design tool that examines multiview drawings, layers, dimensioning, blocks, and sectional views. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4310 (5310). Plant Layout and Materials Handling.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3301, MET 3710 or departmental approval. An analysis of materials movement within industrial organizations. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4400 (5400). Geometric Dimensioning and Tolerancing.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3301 or department approval. This course will cover the geometric conformance and tolerancing theory and application pertaining to ANSI/ASME Y14.5M-1994 via computer graphics and other electronic data systems for design, manufacture, verification, and similar processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4430 (5430). Industrial Supervision.

Lec. 3. Credit 3.

Prerequisite: Senior or Graduate Standing. Supervisory responsibilities in an organization and procedures for meeting these responsibilities. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4450 (5450). Additive Manufacturing.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3301 or departmental approval. This course prepares students to create a rapid prototyping file from a computer aided design file, determine the prototype for the model or part, and create a production plan for the part. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4500 (5500). Tool Design.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 2065, MET 3301 or departmental approval. This course covers an integrated treatment of tool design, specification and application by the use of standard tooling data. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4550 (5550). Maintenance, Replacement and Reliability Engineering.

Lec. 3. Credit 3.

Prerequisite: Senior or Graduate Standing in Engineering, Engineering Technology or Business. Reliability networks, failure mode and effect analysis,

apportionment, availability, maintainability, fault trees and human reliability. Design project required.

MET 4600 (5600). Product Design & Development.

Lec. 3. Credit 3.

Prerequisite: Senior or Graduate Standing in Engineering, Engineering Technology or Business. This is a project-based course that covers modern tools and methods for product design and development. Topics include identifying customer needs, concept generation, product architecture, industrial design, and design-for-manufacturing.

MET 4615. Engineering Technology Ethics and Professionalism.

Lec. 1. Credit 1.

Prerequisite: Senior Standing. This course examines the values and ethics of a technological society and the input of the technologist into the decision making process of a technological organization.

MET 4620. Senior Projects.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MET 3403, MET 3260 or departmental approval. This course is the capstone experience, which requires both teamwork and individual skills in identifying and solving an industrial problem. It requires the application of design, manufacturing processing, project management plan and public presentation of results.

MET 4650 (5650). Lean Six Sigma Manufacturing.

Lec. 3. Credit 3.

Prerequisite: Senior or Graduate Standing in Engineering, Engineering Technology or Business. Review of current engineering and technology techniques relevant to manufacturing, service, quality and productivity. Design project required.

MET 4700. Automation of Manufacturing Systems.

Lec. 3. Credit 3.

Prerequisite: Senior or Graduate Standing in Engineering or Engineering Technology. General principles of operation and programming of automated systems. Automated assembly, automated manufacturing, and inspection systems. Control of automated manufacturing. Industrial logic systems and programmable logic controllers. Computer numerical control, industrial robotics, and computer integrated manufacturing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4990 (5990). Special Problems.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Senior Standing. Investigations of industrial topics in the students area of interest. May be taken under different subtitles to a maximum of six credits. A particular topic may be offered at most twice under the

MET 4990 number. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Marketing (MKT)

Enrollment in Junior- or Senior-level MKT courses requires Junior Standing. All Business majors must have completed the Basic Business Program.

MKT (ENTR) 3200. Entrepreneurial Mindset.

Lec. 3. Credit 3.

This introductory course provides a framework of entrepreneurial thinking and acting. Specifically, this course aims to help students become more customer-oriented and opportunity-driven in acting on innovative ideas, serve as change agent, and learn leveraging resources while mitigating and managing risks. It further provides a basic infrastructure in business, so students can accomplish the eventual transition of successfully managing, financing and marketing the business venture and products/services in increasingly competitive global market places/spaces.

MKT 3310. Services Marketing.

Lec. 3. Credit 3.

This course will focus on service organizations, and services marketing issues to make students aware of the unique challenges involved in marketing and managing organizations in sections such as finance, health care, entertainment, hospitality, professional services, retailing, education and transportation. Some of the specific topics will include understanding service processes, learning how to manage service encounters, consumer behavior in service settings, complaint handling, pricing and positioning of services, and balancing demand and capacity.

MKT 3400. Principles of Marketing.

Lec. 3. Credit 3.

Prerequisite: ECON 2010. Marketing in an economic system, including marketing strategy and marketing mix variables available to the marketing manager.

MKT 3430. Advertising.

Lec. 3. Credit 3.

Prerequisite: MKT 3400. Techniques and methods of advertising, including an analysis of major media. Emphasis on case studies and special projects involving integrated advertising campaigns and trends.

MKT 3650. Sales Management.

Lec. 3. Credit 3.

Prerequisite: MKT 3400. Responsibilities and techniques of managing the sales force. Course includes case studies.

MKT 3900. Entrepreneurship/Small Business.

Lec. 3. Credit 3.

Prerequisite: MKT 3400 or permission of instructor. An

introduction to the process of new venture creation and the challenges of operating and growing a small business.

MKT 4100. International Marketing.

Lec. 3. Credit 3.

Prerequisite: MKT 3400. Focuses on the study of consumer behavior and buying cultures in all major regions of the world and relates the information to the creation of international marketing plans and strategies.

MKT 4500. Retail Marketing Management.

Lec. 3. Credit 3.

Prerequisite: MKT 3400. Theory and practice of modern retail marketing. Included are merchandising, budgeting, store location and design, retail pricing decisions, product sourcing, and promotion strategies.

MKT 4530. Consumer Behavior. Lec. 3. Credit 3.

Prerequisite: MKT 3400 or consent of instructor. This course provides a comprehensive interdisciplinary framework of consumer behavior concepts and processes. It further enables students to apply what is learned to market analysis, product/service design, strategy and control of marketing programs.

MKT 4550. Business Marketing Management.

Lec. 3. Credit 3.

Prerequisite: MKT 3400. Study of business marketing management including industrial buying practices, governmental buying, business services, institutional marketing, modern purchasing practices, TQM decision making, and inventorying, particularly JIT.

MKT 4620 (5620). Marketing Research.

Lec. 3. Credit 3.

Prerequisite: MKT 3400 and ECON 3610. Information systems and traditional research through text and cases.

MKT 4730 (5730). Marketing Strategy.

Lec. 3. Credit 3.

Prerequisite: MKT 3400, BMGT 3510, and two marketing courses beyond MKT 3400. The role of the modern marketing manager in making marketing decisions and selecting strategies. Includes case studies.

MKT 4900. Special Topics in Marketing.

Lec. 3. Credit 3.

Prerequisite: MKT 3400 and approval of the instructor. Selected current topics in Marketing.

MKT 5200. Basic Marketing. Lec. 3. Credit 3.

Structure of markets, techniques and tools available to the marketing manager, motivation of buyers.

Mathematics (MATH)

MATH 1000. Transitional Algebra.

Rec. 3. Credit 3.

Exponents and roots; polynomials, rational, radical, and absolute value expressions; factoring; linear equations and inequalities; quadratic equations, graphing; functions.

◆**MATH 1010. Math for General Studies.**

Lec. 3. Credit 3.

Mathematics as applied to real-life problems selected from such topics as preference schemes for voting, fair division and apportionment methods, routing and scheduling problems, analysis of graphs, growth and symmetry, and counting problems.

MATH (PHYS) 1020. First-Year Connections.

Rec. 2. Credit 1.

This course is intended as a bridge course for students entering TTU from high school. The course is designed to strengthen the student's connection to TTU, the College of Arts and Sciences, and the appropriate department (CSC, MATH, or PHYS) by focusing on the enhancement of skills needed for academic success. This course engages the student in meaningful academic and non-academic out-of-the-classroom activities, as learning occurs both in and out of the classroom. It emphasizes critical thinking, the formation of academic and social goals and support groups, and time-management and study skills.

◆**MATH 1130. College Algebra.** Lec. 3. Credit 3.

Review of algebra and coordinate geometry; functions; polynomial, rational, exponential, and logarithmic functions; systems of equations; binomial formula; counting (multiplication principle, permutations, and combinations); and conics. Credit towards graduation will not be given for MATH 1130 and MATH 1710 or for MATH 1130 and MATH 1730.

MATH 1410. Number Concepts for Teachers.

Lec. 3. Credit 3.

Prerequisite: Admission is restricted to students majoring in Elementary Education. Introduction to sets and operations on sets, properties and operations on whole numbers, integers, and rational and real numbers.

◆**MATH 1420. Geometry Concepts for Teachers.**

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 1410; Admission is restricted to students majoring in Elementary Education. Introduction to elements of probability and statistics, and basic concepts of Euclidean geometry including congruence, similarity, measurements, areas, and volumes.

◆MATH 1530. Introductory Statistics.

Lec. 3. Credit 3.

Descriptive statistics including measures of central location and variation, frequency distributions, histograms, and frequency polygons. Probability relating to elementary sample spaces, events, conditional probability, discrete and continuous type random variables, mathematical expectation, and the normal probability distribution. Inferential statistics relating to the confidence intervals and hypothesis test related to the mean and proportion.

◆MATH 1630. Finite Mathematics.

Lec. 3. Credit 3.

Brief review of basic algebra; introduction to probability; matrix algebra and linear programming; and applications to business and economics.

◆MATH 1710. Pre-calculus I. Lec. 3. Credit 3.

Prerequisite: ACT Math score of 22 or higher, or equivalent COMPASS score, or C or better in MATH 1000. Review of algebra; relations and functions and their graphs, including polynomial and rational functions; conic sections; inequalities; arithmetic and geometric sequences and series. Credit will not be given for both MATH 1710 and MATH 1730.

◆MATH 1720. Pre-calculus Trigonometry.

Lec. 3. Credit 3.

Prerequisite: ACT Math score of 22 or higher, or equivalent COMPASS score, or C or better in MATH 1000. Circular functions and radian measure, graphs of the trigonometric functions, trigonometric identities, and equations, the inverse trigonometric functions, polar coordinates. Applications involving triangles, vectors in the plane, and complex numbers. Credit will not be given for both MATH 1720 and MATH 1730.

◆MATH 1730. Pre-calculus Mathematics.

Lec. 5. Credit 5.

Prerequisite: ACT Math score of 25 or higher or equivalent COMPASS score. Two years of high school algebra, one year of high school geometry, and 12 weeks of trigonometry. Review of algebra and trigonometry; relations and functions and their graphs, including polynomial and rational functions; conic sections; inequalities; polar coordinates; complex numbers; and advanced topics in algebra. Credit will not be given for both MATH 1730 and any of MATH 1130, MATH 1710 and MATH 1720.

◆MATH 1830. Applied Calculus. Lec. 3. Credit 3.

Prerequisite: ACT Math score of 25 or above and three years of high school mathematics, including algebra and

geometry; or, special permission of the Mathematics Department; or, C or better in MATH 1130 or MATH 1710 or equivalent. A survey of limits, continuity, and the differential and integral calculus with applications in business, economics and the life sciences.

MATH 1845. Technical Calculus. Lec. 3. Credit 3.

Prerequisite: ACT Math score of at least 25 and four years of high school mathematics, including algebra, geometry, trigonometry, and advanced or pre-calculus mathematics; or, special permission of the Mathematics Department; or, C or better in MATH 1730; or, C or better in MATH 1710 and 1720 or equivalent. A survey of differential and integral calculus of functions of a single variable including transcendental functions.

◆ MATH 1910. Calculus I. Lec. 4. Credit 4.

Prerequisite: ACT Math score of 27 or above and four years of high school mathematics, including algebra, geometry, trigonometry, and advanced or pre-calculus mathematics; or special permission of the Mathematics Department; or, C or better in MATH 1730; or, C or better in MATH 1720 and MATH 1710; or equivalent. Limits, continuity, and derivatives of functions of one variable. Applications of differentiation and introduction to the definite integral.

MATH 1911. Calculus I Honors Seminar.

Lab. 1. Credit 0.

Corequisite: Concurrent enrollment in MATH 1910. An ACT score of 30 or higher is also recommended. Selected topics to add depth to the understanding of the material in MATH 1910. Honors students can receive honors credit for MATH 1910 by successfully completing both MATH 1910 and MATH 1911.

MATH 1920. Calculus II. Lec. 4. Credit 4.

Prerequisite: C or better in MATH 1910 or equivalent AP credit for MATH 1910. Integration techniques, applications of the definite integral, polar coordinates, parametric equations, sequences, and series.

MATH 1921. Calculus II Honors Seminar.

Lab. 1. Credit 0.

Prerequisite: MATH 1911 or permission of the instructor. A grade of A in MATH 1910 is also recommended. Corequisite: Concurrent enrollment in MATH 1920. Selected topics to add depth to the understanding of the material in MATH 1920. Honors students can receive honors credit for MATH 1920 by successfully completing both MATH 1920 and MATH 1921.

MATH 2010. Introduction to Linear Algebra.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 1910. Systems of

linear equations, matrix algebra, inverses, matrix factorizations, determinants, vector spaces and dimension, rank, linear transformations, eigenvalues and eigenvectors, inner product, orthogonal projections.

MATH 2110. Calculus III. Lec. 4. Credit 4.
Prerequisite: C or better in MATH 1920; or equivalent AP credit for MATH 1910 and MATH 1920. Analytic geometry and vectors, differential calculus of functions of several variables, multiple integration, and topics from vector calculus.

MATH 2120. Differential Equations. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 1920. First order equations, linear equations of higher order, power series solutions (including Frobenius method), Laplace transforms, other topics. It is recommended but not required that students take MATH 2010 before taking MATH 2120.

MATH 2610. Discrete Structures. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 1920. Topics to be chosen from algebra of sets and relations, functions, algebras, graphs and digraphs, monoids and machines, groups and subgroups, computer arithmetic, binary codes, logic, and languages.

MATH 3000. Selected Topics in Mathematics. Lec. 1. Credit 1.
Prerequisite: C or better in MATH 1920 and consent of instructor. Lectures on and discussion of topics from upper level mathematics to be selected by the instructor in a setting with less structure than in a traditional class.

MATH 3070. Statistical Methods I. Lec. 3. Credit 3.
Prerequisite: Recommended C or better in MATH 1130. Introduction to parametric statistical methods with some non-parametric alternatives, sampling, probability, Type I and Type II error, sample size estimation, confidence interval estimation, test of hypotheses using normal, Student's t, Snedecor's F, Chi-square and the binomial distributions, linear regression, analysis of variance, and data analysis utilizing statistical software.

MATH 3080. Statistical Methods II. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3070. Introduction to parametric statistical methods with some non-parametric alternatives, sampling, probability, Type I and Type II error, sample size estimation, confidence interval estimation, test of hypotheses using normal, Student's t, Snedecor's F, Chi-square and the binomial distributions, linear regression, analysis of variance, and data analysis utilizing statistical software.

MATH 3400. Introduction to Concepts of Mathematics. Lec. 2. Rec. 2. Credit 3.
Prerequisite: C or better in MATH 1920. A rigorous treatment of elements of logic and set theory including propositional calculus (statements, connectives, conditionals, and negation), quantifiers, sets and operations on sets, mappings, equivalence relations, and mathematical induction. Students are expected to work in an abstract setting using precise definitions and formal proofs.

MATH 3430. College Geometry. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400. A rigorous development of geometry from first concepts using the metric approach. Topics include constructions and hyperbolic geometry.

MATH 3470. Introductory Probability and Statistics. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 1920. Probability, random variables, discrete and continuous distributions and their simulation, elementary sampling theory, and estimation with an overall emphasis on simulation of random processes (Not allowed for mathematics majors after having taken MATH 4480 (5480).)

MATH 3670. Theory and Applications of Random Signals. Lec. 2. Credit 2.
Introduction to randomization, unconditional and conditional probability, independence, and concepts of random variables. Distributions and density functions, moments and moment generating functions, univariate and multivariate random variables, random process concepts, spectral characteristics of random processes, and linear systems with random inputs.

MATH 3810. Complex Variables. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2110. Complex numbers, calculus of complex variables, analytic functions, Cauchy's Theorem, series, the Residue Theorem, and applications.

MATH 3910. Independent Study. Credit 1-3.
Prerequisite: Consent of instructor. Readings and study under the supervision of a qualified staff member.

MATH 4010 (5010). Modern Algebra I. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2010 or equivalent, and C or better in MATH 3400. Groups and subgroups including cyclic, abelian, finite; permutation groups; group homomorphisms; cosets and Lagrange's Theorem; normal subgroups and factor groups.

MATH 4020 (5020). Modern Algebra II. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4010 (5010). Rings

including integral domains, unique factorization domains and Euclidean domains, ideals and factor rings, ring homomorphisms, fields and their extensions, geometric constructions.

MATH 4050 (5050). Number Theory.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400 or consent of instructor. Properties of integers, division algorithms, prime numbers, diophantine equations, and congruences.

MATH 4110 (5110). Advanced Calculus I.

Lec. 2. Rec. 2. Credit 3.

Prerequisite: C or better in MATH 3400 or consent of instructor. Rigorous treatment of functions of one and several variables, improper integrals, sequences, infinite series, uniform convergence, and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class.

MATH 4120 (5120). Advanced Calculus II.

Lec. 2. Rec. 2. Credit 3.

Prerequisite: C or better in MATH 4110 (5110). Rigorous treatment of functions of one and several variables, improper integrals, sequences, infinite series, uniform convergence, and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class.

MATH 4210 (5210). Numerical Analysis I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 1920. Iterative methods for nonlinear equations, computational error analysis, convergence of iterative techniques, interpolation, numerical differentiation and integration, approximate solutions of initial-value problems, boundary-value problems, and nonlinear systems, and direct and iterative methods for linear systems.

MATH 4220 (5220). Numerical Analysis II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2120 or consent of instructor. Iterative methods for nonlinear equations, computational error analysis, convergence of iterative techniques, interpolation, numerical differentiation and integration, approximate solutions of initial-value problems, boundary-value problems, and nonlinear systems, and direct and iterative methods for linear systems.

MATH 4250 (5250). Advanced Ordinary Differential Equations I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2110 and MATH 2120. Systems of ordinary differential equations, matrix

methods, approximate solutions, stability theory, basic theory of nonlinear equations and differential systems, trajectories, phase space stability, and construction of liapunov functions.

MATH 4260 (5260). Advanced Ordinary Differential Equations II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 4250 (5250). Systems of ordinary differential equations, matrix methods, approximate solutions, stability theory, basic theory of nonlinear equations and differential systems, trajectories, phase space stability, and construction of liapunov functions.

MATH 4310 (5310). Introduction to Topology I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400. Topological spaces, continuity, connectedness, compactness, separation axioms, function spaces, and fundamental groups.

MATH 4320 (5320). Introduction to Topology II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 4310 (5310). Topological spaces, continuity, connectedness, compactness, separation axioms, function spaces, and fundamental groups.

MATH 4350 (5350). Introductory Combinatorics.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400 or consent of instructor. Topics to be covered include permutations, combinations, multisets, partitions, recurrence relations, generating functions, and the principle of inclusion-exclusion.

MATH 4360 (5360). Graph Theory.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400 or consent of instructor. Fundamental concepts of undirected and directed graphs, trees, connectivity, traversability, colorability, network flows, and matching theory.

MATH 4410 (5410). Differential Geometry.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2110, MATH 2010 and MATH 3400. Geometry of curves and surfaces in three dimensional space. Calculus on surfaces, curvature, and Riemannian geometry.

MATH 4470 (5470). Probability and Statistics I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2110. Mathematical foundations of elementary statistical methods, application and theory, probability in discrete and continuous distributions, correlation and regression, sampling distributions, and significance tests.

MATH 4480 (5480). Probability and Statistics II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 4470 (5470).
Mathematical foundations of elementary statistical methods, application and theory, probability in discrete and continuous distributions, correlation and regression, sampling distributions, and significance tests.

MATH 4510 (5510). Advanced Mathematics for Engineers.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2110 and MATH 2120.
Fourier series, Sturm-Liouville problems, orthogonal functions, Legendre polynomials, Bessel functions, separable partial differential equations (e.g. heat, wave and Laplace equations) and other topics.

MATH 4530 (5530). Linear Algebra I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2010 and MATH 3400.
A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations, dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, and quadratic and bilinear forms.

MATH 4540 (5540). Linear Algebra II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 4530 (5530).
A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations, dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, and quadratic and bilinear forms.

MATH 4610 (5610). History of Mathematics I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400.
The development of mathematics and its relation to the development of civilization prior to the beginnings of calculus.

MATH 4620 (5620). History of Mathematics II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400.
History of mathematics from the beginnings of calculus through the modern times.

MATH 4710 (5710). Vector Analysis.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2110.
The algebra and the differential and integral calculus of vectors and applications to geometry and mechanics.

MATH 4750 (5750). Category Theory of Sets.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 3400 (or consent of instructor for MATH 5750).
Abstract sets and mappings, categories, sums, universal property, monomorphisms

and parts, finite inverse limits, colimits, epimorphisms, the Axiom of Choice, mapping sets and exponentials, covariant and contravariant functoriality of function spaces, Cantor's diagonal argument, powers sets, variable sets, models of additional variation, and selected applications.

MATH 4850 (5850). Computational Algebraic Geometry I.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2010 and C or better in MATH 3400 or equivalent (or consent of instructor for MATH 5850).
Additional recommended prerequisite: MATH 4010 (5010) or any other 4000/5000-level mathematics course in which proofs are required.
Affine varieties and polynomial ideals, Groebner bases, elimination theory, Hilbert's Nullstellensatz, Zariski closure, and decomposition into irreducible varieties.

MATH 4860 (5860). Computational Algebraic Geometry II.

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 4850 (5850).
Polynomial and rational functions on a variety, projective varieties, the dimension of a variety, selected applications in robotics, automatic theorem proving, and invariant theory of finite groups.

MATH 4910, 4920 (5910, 5920). Directed Readings.

Credit 1-3.

Prerequisite: Consent of instructor.
These courses provide an opportunity for individual reading and study under the supervision of a qualified staff member.

MATH 4950 (5950). Topics in Mathematics.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor.
A formal course in any area where there is no other course offering. May be taken more than once provided that the topic is different.

MATH 4970. Senior Seminar.

Lec. 1. Credit 1.

Prerequisite: Senior Standing.
Preparation of papers at an advanced level in mathematics to be presented both in writing and orally.

MATH 4991, 4992, 4993. Mathematical Research.

Credit 1, 2, 3.

Prerequisite: C or better in MATH 1920 and consent of instructor.
This course introduces students to the process of performing research. By reading papers the students will learn how to define open and significant problems, set up a research plan and, if applicable, define relevant experiments. Students will be required to give presentations on either their own or other people's research. These courses can be taken for credit more than once.

◆ **Meets Tennessee Technological University general education requirement (Mathematics).**

Mechanical Engineering (ME)

ME 2330. Dynamics. Lec. 3. Credit 3.
Prerequisite: CEE 2110 and PHYS 2110. Kinematics; relative motion; kinetics, applications of Newton's Laws, work-energy principle, impulse-momentum principle, vibrations.
(ENGR 2120, TTP Course)

ME 3001. Mechanical Engineering Analysis. Lec. 3. Credit 3.
Prerequisite: ENGR 1120, MATH 2010 and MATH 2120. Analytical and numerical techniques are developed for problems arising in mechanical engineering. Analytical methods include applications of Laplace transforms, Fourier series and separation of variables. Numerical methods include root finding, quadrature rules, and solutions to ordinary and partial differential equations. Use of modern numerical computing tools for problem solving.

ME 3010. Materials and Processes in Manufacturing. Lec. 3. Credit 3.
Prerequisite: CHEM 1010 or CHEM 1110. Processing/microstructure/property interrelations; heat treatment of steels and alloys; overview of manufacturing processes; interrelations among materials, design and manufacturing; and introduction to material selection.

ME 3023. Measurements in Mechanical Systems. Lec. 2. Lab. 2. Credit 3.
Prerequisite: ECE 2010, PHYS 2120, PHYS 2121 (or ECE 2011 for ME Mechatronics Concentration) and CEE 3110 (CEE 3110 may be taken concurrently). Principles of measurement and calibration; basic instrumentation and measurement techniques in mechanical systems.

ME 3050. Dynamic Modeling and Controls. Lec. 3. Credit 3.
Prerequisite: ME 2330, ME 3023 and ME 3001. Corequisite: ME 3060. Modeling and simulation of lumped parameter systems, mechanical, electrical, thermal, fluid, and/or mixed, stability, time and frequency response; vibration applications; control algorithms.

ME 3060. Dynamic Modeling and Controls Lab. Lab. 2. Credit 1.
Corequisite: ME 3050. Experiments and simulations of lumped parameter mechanical systems; time and frequency response; vibration applications; control algorithms.

ME 3110. Physical Metallurgy and Heat Treatment. Lec. 3. Credit 3.
Prerequisite: Junior Standing. Structure and properties

of ferrous and nonferrous metals and alloys; equilibrium diagrams; heat treatment methods and effects; and behavior in service. Not for ME majors.

ME 3210. Thermodynamics I. Lec. 3. Credit 3.
Prerequisite: CHEM 1110 and MATH 2110. Concepts, models and laws; energy and the first law; properties and state; energy analysis of thermodynamics systems; entropy and the second law; and conventional power and refrigeration cycles.

ME 3220. Thermodynamics II. Lec. 3. Credit 3.
Prerequisite: ME 3210. Gas power and refrigeration cycles, exergy analysis; real and ideal gas mixtures; combustion and chemical equilibrium.

ME 3610. Dynamics of Machinery. Lec. 3. Credit 3.
Prerequisite: ME 2330. Motion converters and design process. Mobility equations; solutions of vector equations; kinematic position, velocity and acceleration analysis of mechanisms; introductory geometric synthesis of linkages; design of cam-follower mechanisms; gear tooth geometry; analysis and synthesis of gear trains and planetary gear differentials; and computer aided studies.

ME 3710. Heat Transfer. Lec. 3. Credit 3.
Prerequisite: MATH 2120 and ME 3210. ME 3210 may be taken concurrently. Single and multidimensional steady-state and transient heat conduction; role of convection for internal and external forced flows and in buoyancy-driven flow; and thermal radiation processes and properties.

ME 3720. Fluid Mechanics. Lec. 3. Credit 3.
Prerequisite: ME 2330. Fundamentals of fluid flow; fluid statics; systems and control volumes; continuity, momentum and energy equations; dynamic similitude; one-dimensional open channel flow; and compressible flow.

ME 4010. Machine Design. Lec. 3. Credit 3.
Prerequisite: CEE 3110, ME 2330 and ME 3010. Tools of machine design; stress strain and deformation of machine parts; inherent properties of machine parts; design of machine parts for strength; design of machine parts for rigidity.

ME 4020 (5020). Applied Machine Design. Lec. 2. Lab. 2. Credit 3.
Prerequisite: ME 3610 and ME 4010. Design for strength and rigidity under dynamic loads; shaft design; design of joints (threaded fasteners, welds, springs, keys, etc.); design of gear trains; lubrication and bearing design; finite element analysis; and optimization, and statistical consideration in design.

ME 4060 (5060). Machine Vibrations.

Lec. 3. Credit 3.

Prerequisite: ME 3050. Linear vibration of machine elements, lumped parameter multidegree of freedom and continuous system solutions; computer-aided solutions of linear and nonlinear systems; and simple laboratory vibration measurement and comparative vibration analysis.

ME 4120 (5120). Intermediate Dynamics.

Lec. 3. Credit 3.

Prerequisite: ME 2330. Rigid-body kinematics, plane and three-dimensional rigid-body kinetics, Lagrangian mechanics, orbital motions, and variable mass rockets.

ME 4140 (5140). Introduction to Robotics and Intelligent Machines Engineering.

Lec. 3. Credit 3.

Prerequisite: ME 3050 and ME 3060; or ECE 3210 and ECE 3260. The combination of ME 3050 and ME 3060 or the combination of ECE 3210 and ECE 3260 may be taken concurrently. Robotic concepts and subsystems; mechanics of robots; sensors and intelligence; actuators; and trajectory planning and control.

ME (CEE) 4160 (5160). Experimental Stress Analysis.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: CEE 3110 and MATH 2120. Introduction to theory of elasticity; photoelasticity; theory and application of strain gages and rosettes; brittle coatings; holographic interferometry; and moiré analysis.

ME 4180 (5180). Finite Element Methods in Mechanical Design.

Lec. 3. Credit 3.

Prerequisite: CEE 3110. Fundamental concepts; displacement-based finite element formulation using energy methods; one-dimensional and two-dimensional finite elements; modeling considerations and convergence; programming and an introduction to a commercial program.

ME (CEE) 4190 (5190). Advanced Mechanics of Materials.

Lec. 3. Credit 3.

Prerequisite: CEE 3110, MATH 2120 or consent of instructor. Advanced topics; fracture mechanics, elastic support, noncircular shafts, curved beams, thick-walled cylinders, introduction to plates, and thin shells of revolution.

ME 4210. Refrigeration and Air Conditioning.

Lec. 3. Credit 3.

Prerequisite: ME 3220, ME 3710 and ME 3720. Refrigeration systems and HVAC design concepts; air-conditioning systems, principles of psychrometrics, human comfort, and principles for building load calculations and annual energy use simulations.

ME 4220. Air Conditioning Design.

Lec. 3. Credit 3.

Prerequisite: ME 3220, ME 3710 and ME 3720. Design of heating, cooling and ventilation systems for buildings. Duct system design, pipe system layout, and equipment selection.

ME 4260 (5260). Energy Conversion and Conservation.

Lec. 3. Credit 3.

Prerequisite: ME 3220, ME 3710 or equivalent. An in-depth study of industrial steam, pumping and compressed air systems in terms of how to reduce system energy consumption.

ME 4310 (5310). Gas Dynamics.

Lec. 3. Credit 3.

Prerequisite: ME 3220 and ME 3720. Balance laws, shock waves, Prandtl/Meyer expansion, flow through ducts and nozzles, unsteady wave motion, linearized supersonic thin airfoil theory.

ME 4370 (5370). Mechatronics and Intelligent Machines Engineering.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ECE 2010, PHYS 2121, ME 3050 and ME 3060. Mechatronics; number systems; microcontroller technology and architecture of 8-bit microcontrollers (e.g. Motorola MC68H110), assembly language programming, A/D and D/A conversion, parallel I/O; programmable timer operation, interfacing sensors and actuators, applications, and team project on design and implementation of a mechatronic system.

ME 4410. Senior Design Project I.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: Completion of required 3000-level ME courses; ME 4010. Co-requisite: ME 3050, ME 3060, ME 4910, ME 4020 or ME 4720. Principles of engineering design with emphasis on contemporary industrial design processes and engineering economics with applications in product design. Development phase for capstone team design project in mechanical engineering: preliminary design, supporting analyses and drawings with bill of materials.

ME 4420. Senior Design Project II.

Lec. 1. Lab. 4. Credit 3.

Prerequisite: ME 4410; ME 4020 or ME 4720; ME 3050; ME 3060; ME 4910. Continuation of ME 4410. Prototyping and testing phase for capstone team design project. Final design reporting (written and oral).

ME 4450 (5450). Design for Manufacturability.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ME 3010 and CEE 3110. Material and manufacturing process constraints on design shape, size and quantity; plastic and fibrous composite parts manufacturing; rapid prototyping; design for X; dimensions and tolerances.

ME 4460 (5460). Mechanical Properties of Materials.

Lec. 3. Credit 3.

Prerequisite: CEE 3110, ME 3010 or consent of instructor. Elastic and anelastic properties, dislocations, slip, plastic deformation, fracture mechanics, creep, fatigue and fatigue crack propagation, materials testing, and introduction to failure analysis.

ME (CHE) 4470 (5470). Interdisciplinary Studies in Ceramic Materials Processing.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: CHEM 1120, MATH 2120 and PHYS 2110. Selected materials synthesis for metals, ceramics and their composites, application of fracture mechanics and failure models, mechanical, chemical, and morphological characterization theory and practice, and materials design.

ME 4480 (5480). Microstructural Analysis.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: ME 4460 (5460). Techniques and applications of microstructural analysis; optical microscopy; metallography; electron microscopy; and fractography and failure analysis.

ME 4490 (5490). Properties and Selection of Engineering Materials.

Lec. 3. Credit 3.

Prerequisite: ME 3010. An intermediate course in materials engineering emphasizing the interrelations among material properties, microstructure, and optimum material selection for design applications.

ME 4510 (5510). Aerodynamics.

Lec. 3. Credit 3.

Prerequisite: ME 3720. Atmospheric fluid statics, ideal fluid dynamics, potential flow, lift and drag estimation, powered flight, glides, takeoffs, landings.

ME 4610. Steam Power Plants.

Lec. 3. Credit 3.

Prerequisite: ME 3220, ME 3710 and ME 3720. Energy sources, fuels, firing methods, boilers, turbine characteristics, cooling water and cooling towers, dust collection, new developments in energy generation, plant trip.

ME 4620 (5620). Turbomachinery.

Lec. 3. Credit 3.

Prerequisite: ME 3720. Presents a generalized description and unified theory pertaining to the classification, operation, selection and basic design of rotating turbomachines--pumps, fans, compressors, and turbines; topics of current interest.

ME 4630. Internal Combustion Engines.

Lec. 3. Credit 3.

Prerequisite: ME 3220, ME 3710 and ME 3720. Ideal fuel/air cycles, heat loss, friction, combustion and

detonation, carburetion and fuel injection; air flow, normal overall performance, and extreme performance.

ME 4640 (5640). Dynamics of Machinery II.

Lec. 3. Credit 3.

Prerequisite: ME 3610. Graphical and analytical synthesis of linkage mechanisms for function generation, motion generation and path generation. Kinetostatic analysis of linkage mechanisms; engine dynamics and balancing; and rigid-body dynamics, time response analysis.

ME 4720. Thermal Design.

Lec. 3. Credit 3.

Prerequisite: ME 3220, ME 3710 and ME 3720. Introduction to the design of thermofluid devices and systems; general design methodology, modeling, simulation, and optimization; and heat exchangers and prime movers in systems.

ME 4730 (5730). Numerical Heat Transfer.

Lec. 3. Credit 3.

Prerequisite: ECE 2010, PHYS 2121 (or ECE 2011 for ME Mechatronics Concentration); ME 3050 and ME 3060. Fundamentals of numerical methods; steady and unsteady one-dimensional heat conduction; steady and unsteady multi-dimensional heat conduction; fully-developed duct flows; one- and two-dimensional convection heat transfer, and flow through porous media.

ME 4751. Energy Systems Lab.

Lec. 1. Lab. 2. Credit 2.

Prerequisite: ME 3023, ME 3710 and ME 3720. Basic instrumentation and principles of measuring pressure, temperature, fluid velocity, and fluid flow rate; demonstrations, measurements, and evaluations of heat transfer and fluid flow processes.

ME 4810 (5810). Automatic Controls.

Lec. 3. Credit 3.

Prerequisite: ME 3050. ME 3050 may be taken concurrently. Mathematical modeling of physical systems, control algorithms, stability, transient response, and frequency response.

ME 4900. Special Topics.

Credit 3.

Prerequisites: Junior or Senior standing. Special topics of current interest in mechanical engineering that are not covered in existing courses. Because of the impossibility of duplicating the conditions for a special topic, this course may not be repeated for the improvement of a grade.

ME 4910. Professionalism and Ethics.

Lec. 1. Credit 1

Prerequisite: Junior or senior standing. Professional, social and ethical issues in engineering practice; oral and written technical communication.

ME (CEE) 4930 (5930). Noise Control.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: MATH 2120 and PHYS 2110. Identification and description of noise sources and noise radiation, methods of noise measurement and criteria for noise levels, principles and techniques of noise control.

ME 4990. Undergraduate Research. Credit 3.

Prerequisite: Approval of course instructor and department chairman. Investigation of current research and development interests. May be taken by a single student or by a small group of students if the investigation requires. Because of the impossibility of duplicating the conditions for the investigation, this course may not be repeated for the improvement of a grade.

Military Science, Basic (MS)

MS 1000. Basic Physical Conditioning.

Lab. 3. Credit 1.

Physical Fitness Program to develop stamina, flexibility, coordination, speed, and upper body strength, and to enhance lifestyle.

MS 1001. Basic Physical Conditioning.

Lab. 3. Credit 1.

Physical Fitness Program to develop stamina, flexibility, coordination, speed, and upper body strength, and to enhance lifestyle.

MS 1010. Fundamental Concepts.

Lec. 1. Lab. 1. Credit 2.

Fundamental components of service as an officer. Addresses "life skills," including fitness, communications theory, and interpersonal relationships.

MS 1020. Basic Leadership.

Lec. 1. Lab. 2. Credit 2.

Builds upon previous semester and introduces problem-solving, critical thinking, leadership theory, followership, group interaction, goal setting, and feedback mechanisms.

MS 2000. Basic Physical Conditioning.

Lab. 3. Credit 1.

Army PT Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health, and to enhance lifestyle.

MS 2001. Basic Physical Conditioning.

Lab. 3. Credit 1.

Army PT Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health, and to enhance lifestyle.

MS 2010. Advanced Leadership.

Lec. 2. Lab. 2. Credit 2.

Prerequisite: MS 1010 and MS 1020 or permission of Professor of Military Science. Principal leadership instruction of the Basic Course. Building on the fundamentals introduced in the MS I year, this class delves into several aspects of communication and leadership theory.

MS 2020. Tactics and Officership.

Lec. 2. Lab. 2. Credit 2.

Prerequisite: MS 1010, MS 1020, and MS 2010 or permission of Professor of Military Science. An extensive examination of the unique purposes, roles and obligations of commissioned officers. Includes a detailed look at the origin and practical application of the Army's institutional values.

MS 2800. Basic Course; Individual 3. Credit 3.

Prerequisite: Permission of the Professor of Military Science. Five weeks of training during the summer. Conducted at an Army post; leadership, small unit tactics, weapons, drill and a writing assignment due two weeks after the five weeks of training.

Advanced
MS 3000. Advanced Physical Conditioning.

Lab. 3. Credit 1.

Army Physical Fitness Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health, and to enhance lifestyle.

MS 3001. Advanced Physical Conditioning.

Lab. 3. Credit 1.

Army Physical Fitness Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health, and to enhance lifestyle.

MS 3010. Small Unit Leadership.

Lec. 3. Lab. 2. Credit 3.

Leadership and development through study and practical application of principles of social sciences and management and military tactics.

MS 3020. Small Unit Operations.

Lec. 3. Lab. 2. Credit 3.

Practical application of leadership skills. Techniques for planning, organizing, and decision-making in military operations.

MS 3040. Advanced Course; Individual 3. Credit 3.
Prerequisite: MS 3010 and MS 3020. Five weeks of training conducted at an Army Post evaluating practical application of classroom skills and developing leadership potential.

MS 3222. Introduction to Officer Professional Development; Individual. Lec. 3. Credit 3.
Course may be repeated for three credits once with new individual requirements assigned by the Military Science Department Chairperson. The course is designed to foster and instill necessary life-long learning necessary from the Military professional.

MS 4000. Advanced Physical Conditioning. Lab. 3. Credit 1.
Application of planning/conducting Army Physical Fitness Program.

MS 4001. Advanced Physical Conditioning. Lab. 3. Credit 1.
Application of planning/conducting Army Physical Fitness Program.

MS 4002. Advanced Physical Conditioning. Lab. 3. Credit 1.
Prerequisite: Consent of instructor. Army Physical Fitness Program.

MS 4003. Advanced Physical Conditioning. Lab. 3. Credit 1.
Prerequisite: Consent of instructor. Army Physical Fitness Program.

MS 4010. Leadership, Management & Ethics. Lec. 3. Lab. 2. Credit 3.
Techniques of military leadership, communications, ethics, and decision-making process. Includes research and writing requirements.

MS 4020. Transition to Lieutenant. Lec. 3. Lab. 2. Credit 3.
Advanced techniques in leadership, planning and decision making. Includes research, writing requirements, and battlefield study trip.

Music (MUS)

All music majors must achieve a grade of "C" in each music course. If a lower grade is earned, the student must repeat the course.

Class Instruction

MUS 1011. Beginning Class Piano for Music Majors I. Lec. 1. Lab. 1. Credit 1.
Designed to give a functional knowledge of the piano.

MUS 1012. Beginning Class Piano for Music Majors II. Lec. 1. Lab. 1. Credit 1.
Designed to give a functional knowledge of the piano.

MUS 1013. Recital Class. Credit 0.

MUS 1021. Class Voice Instruction I. Lec. 1. Lab. 1. Credit 1.
Rudiments of posture, breathing and song interpretation, tone production, and stage deportment.

MUS 1022. Class Voice Instruction II. Lec. 1. Lab. 1. Credit 1.
Rudiments of posture, breathing and song interpretation, tone production, and stage deportment.

MUS 1023. Intermediate Class Piano for Music Majors III. Lec. 1. Lab. 1. Credit 1.
Prerequisite: MUS 1012 or previous piano experience. Designed to prepare music students with previous keyboard experience for the piano proficiency examination.

MUS 1024. Intermediate Class Piano for Music Majors IV. Lec. 1. Lab. 1. Credit 1.
Prerequisite: MUS 1023 or previous piano experience. Designed to prepare music students with previous keyboard experience for the piano proficiency examination.

MUS 1027. Keyboard Skills for Music Therapy I. Lab. 2. Credit 1.
Prerequisite: Music Therapy major; passed ALL portions of piano proficiency. Keyboard skills and repertoire necessary for the practice of music therapy, including: accompaniment, harmonization, improvisation, performance of selected repertoire.

MUS 1028. Keyboard Skills for Music Therapy II. Lab. 2. Credit 1.
Prerequisite: Music Therapy major; passed ALL portions of piano proficiency; MUS 1027 or consent of instructor. Continuation of MUS 1027. Keyboard skills and repertoire necessary for the practice of music therapy, including: accompaniment, harmonization, improvisation, performance of selected repertoire.

MUS 1029. Oratorio Class. Lab. 2. Credit 1.
A survey of the major representative oratorio literature, which features sections and arias for the solo voice and ensembles. Periods of study will include the Baroque to the Twentieth Century.

MUS 1031. Stringed Instrument Class I. Lec. and Lab. 2. Credit 1.
Each student studies the four instruments of the string section: violin, viola, violincello, and bass viol.

MUS 1032. Stringed Instrument Class II.

Lec. and Lab. 2. Credit 1.

Each student studies the four instruments of the string section: violin, viola, violincello and bass viol.

MUS 1035. Beginning Class Guitar.

Lab. 2. Credit 1.

Accompanying group singing. Emphasis on chords and strumming techniques.

MUS 1036. Intermediate Class Guitar.

Lab. 2. Credit 1.

Prerequisite: MUS 1035 or consent of instructor.

Additional skills and techniques for students already possessing a basic command of the instrument.

MUS 1041. Woodwind Instrument Class I.

Lec. and Lab. 2. Credit 1.

Each student will learn basic performance skills on two instruments each semester.

MUS 1042. Woodwind Instrument Class II.

Lec. and Lab. 2. Credit 1.

Each student will learn basic performance skills on two instruments each semester.

MUS 1051. Brass Instrument Class I.

Lec. and Lab. 2. Credit 1.

Each student will learn basic performance skills on two instruments each semester.

MUS 1052. Brass Instrument Class II.

Lec. and Lab. 2. Credit 1.

Each student will learn basic performance skills on two instruments each semester.

MUS 1071. Percussion Instrument Class I.

Lec. and Lab. 2. Credit 1.

Each student will learn basic performing skills on a snare drum and mallet instruments as well as study other percussion family instruments.

MUS 1072. Percussion Instrument Class II.

Lec. and Lab. 2. Credit 1.

Each student will develop performance skills on a wide range of percussion instruments through laboratory ensemble experiences.

MUS 1073. Percussion Techniques.

Lec. and Lab. 2. Credit 1.

Rhythm and percussion instruments for Music Therapy majors.

MUS 1074. Music to Meet Exceptional Education Needs.

Lec. and Lab. 2. Credit 1.

Music leadership skills for the special education setting.

Developing music activities to meet the abilities and needs of students with disabilities.

MUS 1081. Improvisation I.

Lab. 2. Credit 1.

Prerequisite: MUS 1140 and MUS 1150 with a grade of C or better. Development of improvisation skills in varied musical styles. Emphasis on performance and aural perception.

MUS 1082. Improvisation II.

Lab. 2. Credit 1.

Prerequisite: MUS 1081 with a grade of C or better. Development of improvisation skills in varied musical styles. Emphasis on performance and aural perception.

MUS 1195. Student Recital.

Credit 1.

Prerequisite: Consent of studio instructor. Corequisite: Enrollment in private instruction in pertinent studio. Open to any non-curricular solo recital performance. May be repeated for credit. Recital fee applies.

MUS 1210. Diction for Singers I.

Lab. 2. Credit 1.

Language diction for singers, including Latin and Italian, stressing similarities and differences of sung language.

MUS 1220. Diction for Singers II.

Lab. 2. Credit 1.

Prerequisite: MUS 1210. Language diction for singers, including English, German and French, stressing similarities and differences of sung language.

MUS 3530. Music Applications.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Course content is directed toward the music education needs of prospective elementary classroom teachers.

MUS 3540. Music Applications.

Lec. 1. Credit 1.

This course is designed for pre-service elementary school classroom teachers to experience music through singing, playing instruments, moving, reading and writing. They will research, learn and collect a repertoire of music activities for incorporating into and enhancing learning in the general curriculum. Candidates will also reflect upon the role of music in the lives and education of children. Individual, small group and large group activities and assignments will be strategies used in this course. All music majors must achieve a grade of "C" in each music course. If a lower grade is earned, the student must repeat the course.

Music, Music History and Literature

◆MUS 1030. Music Appreciation.

Lec. 3. Credit 3.

Survey of various styles and forms of music with recordings used for class listening.

MUS 1034. American Popular Music.

Lec. 3. Credit 3.

Survey of various forms and styles of American popular music from its origins in African-American blues through rock and roll to the present.

MUS 2030. World Music.

Lec. 3. Credit 3.

Introduction to folk/traditional, classical and pop musical styles from selected areas in Africa, Asia, Europe, and the Americas.

MUS 3010. Music History and Literature I.

Lec. 3. Credit 3.

Prerequisite: MUS 1030, MUS 1140, and MUS 1150 with a grade of C or better. Western music of the Ancient, Medieval, Renaissance, Baroque and Classical periods. Materials basic to research on musical topics.

MUS 3020. Music History and Literature II.

Lec. 3. Credit 3.

Prerequisite: MUS 1030, MUS 1140, MUS 1150 and MUS 3010. Western music of the Romantic period and 20th century. Expansion of research experience on a variety of musical topics.

MUS 3710. Pedagogy and Literature I.

Lec. 2. Credit 2.

Techniques, materials, and methodologies used in the application of learning theory to studio instruction.

MUS 3720. Pedagogy and Literature II.

Lec. 2. Credit 2.

Techniques, materials, and literature for use in the pedagogy of the studio instrument and its generic family in preparation for a studio teaching career.

MUS 3800. Vocal Pedagogy and Literature I.

Lec. 2. Credit 2.

A study in methodologies, principles, and procedures developed for systematized learning in the art of singing. Directed information for the singer, studio teacher, and choral director. Vocal acoustics, breathing, and laryngeal functions are studied.

MUS 3810. Vocal Pedagogy and Literature II.

Lec. 2. Credit 2.

Prerequisite: MUS 3800 with a grade of C or better. Teaching strategies and philosophies, diagnosis of vocal faults, stage deportment, vocal repertoire, and ethics for teachers are studied. Supervised lab experience in teaching by participating students.

MUS 4110 (5110). History and Literature of Jazz.

Lec. 2. Credit 2.

Jazz traced from its multi-ethnic origin through to its present form and its influences on American culture.

MUS 4120 (5120). Contemporary Music.

Lec. 2. Credit 2.

Prerequisite: MUS 3010 or MUS 3020 and MUS 2110-MUS 2120 with a grade of C or better. The culture of musical pluralism since World War II, including art music, jazz, rock, and folk.

◆ Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).

Music, Music Technology

MUS 4250. Recording Techniques.

Lec. 2. Lab. 1. Credit 2.

Prerequisite: MUS 1024, MUS 2130, MUS 2140 with a grade of C or better and Harmony/AT Exam. An introduction to sound recording, including analog and digital formats. Emphasis on applications appropriate to performing musicians.

MUS 4510. Computer Applications in Music.

Lec. 1. Lab. 2. Credit 2.

Prerequisite: MUS 1120 and MUS 1130 with a grade of C or better. An introduction to computer applications in music performance, composition, teaching, and related fields.

Music, Music Theory

MUS 1110. Music Fundamentals. Lec. 3. Credit 3.

A basic course for general students, including the study of music construction, notation, literature and techniques for listening.

MUS 1120. Harmony I.

Lec. 3. Credit 3.

Prerequisite: Passing score on Entrance Exam. Scales, intervals, triads, rhythms, chord functions, part-writing, inversions, cadences, non-harmonic tones, and musical analysis.

MUS 1130. Aural Techniques I. Lab. 2. Credit 1.

Corequisite: MUS 1120. Aural perception, singing, and keyboard performance of materials in MUS 1120.

MUS 1140. Harmony II.

Lec. 3. Credit 3.

Prerequisite: MUS 1120. Corequisite: MUS 1150. Study of diatonic harmony through part-writing, analysis and stylistic composition.

MUS 1150. Aural Techniques II. Lab. 2. Credit 1.

Prerequisite: MUS 1130 with a grade of C or better. Aural perception, singing, and keyboard performance of materials in MUS 1140.

MUS 2110. Harmony III. Lec. 1. Lab. 2. Credit 2.

Prerequisite: MUS 1140 with a grade of C or better.

Chromaticism, altered chords, secondary functions, augmented sixth chords, and musical analysis.

MUS 2120. Aural Techniques III. Lab. 2. Credit 1.
Prerequisite: MUS 1150. Aural perception, singing, and keyboard performance of materials in MUS 2110.

MUS 2130. Harmony IV. Lec. 1. Lab. 2. Credit 2.
Prerequisite: MUS 2110 with a grade of C or better.
Advanced modulation and part-writing procedures.
Survey of 20th Century harmonic techniques, original composition, and musical analysis.

MUS 2140. Aural Techniques IV. Lab. 2. Credit 1.
Prerequisite: MUS 2120 with a grade of C or better.
Corequisite: MUS 2130. Aural perception, singing, and keyboard performance of materials in MUS 2130.

MUS 3130. Form and Analysis. Lec. 2. Credit 2.
Prerequisite: MUS 1024, MUS 2130 with a grade of C or better and Harmony/AT Exam. A comprehensive study of the structure of music from all historic periods.

MUS 3140. Counterpoint. Lec. 3. Credit 3.
Prerequisite: MUS 3130 with a grade of C or better. The study of 18th century/counterpoint: analysis, composition. The relationship between Baroque and 20th century contrapuntal techniques.

MUS 3210. Instrumentation. Lec. 2. Credit 2.
Prerequisite: MUS 1024, MUS 2130, MUS 2140, MUS 4510, MUED 3620 with a grade of C or better and Harmony/AT Exam. Ranges, timbre mixtures, and transpositions for all music media, as related to standard scoring techniques. Ensemble scores are constructed.

MUS 3220. Jazz Composition and Arranging I. Lec. 2. Credit 2.
Prerequisite: MUS 1024, MUS 2130, MUS 2140 with a grade of C or better and Harmony/AT Exam. Original compositions and arrangements in jazz styles for large and small ensembles. Student work will be performed and recorded.

MUS 3230. Jazz Composition and Arranging II. Lec. 2. Credit 2.
Prerequisite: MUS 3220 with a grade of C or better. Original compositions and arrangements in jazz styles for large and small ensembles. Student work will be performed and recorded.

MUS 3240. Choral Literature. Lec. 2. Credit 2.
Prerequisite: MUS 1024, MUS 2130, MUS 2140 with a grade of C or better and Harmony/AT Exam. The study of the diverse types of vocal combinations with attention to age groups, ensemble size and styles. Particular

attention to text setting and the voice with various instrumental possibilities.

MUS 4710 (5710). Supervised Teaching Experience I. Ind. Credit 2.

Activities designed to offer supervised, practical experience in private studio teaching: planning and presenting lessons, and directing individual study.

MUS 4720 (5720). Supervised Teaching Experience II. Ind. Credit 2.
Continuation of MUS 4710 (5710).

Music, Organizations

MUS 1001. Horn Choir. Lab. 2. Credit 0-1.
Preparation of chamber music scores for instruments of the horn family.

MUS 1002. Trombone Choir. Lab. 2. Credit 0-1.
Preparation of chamber music scores for instruments of the trombone family.

MUS 1003. Flute Choir. Lab. 2. Credit 0-1.
Preparation of chamber music scores for instruments of the flute family.

MUS 1004. Clarinet Choir. Lab. 2. Credit 0-1.
Preparation for concert performance of chamber music scores for instruments of the clarinet family.

MUS 1005. Chamber Music. Lab. 2. Credit 0-1.
Preparation for concert performance of vocal and instrumental chamber music scores.

MUS 1007. Tuba Ensemble. Lab. 3. Credit 0-1.
Preparation for concert performance of chamber music scores for instruments of tuba family.

MUS 1009. Trumpet Choir. Lab. 2. Credit 0-1.
Preparation for concert performance of chamber music scores for instruments of the trumpet family.

MUS 1015. Percussion Ensemble. Lab. 2. Credit 0-1.
Preparation for concert performance of music written or transcribed for percussion ensemble.

MUS 1016. Accompanying. Lab. 2. Credit 1.
Instruction and performance in accompanying for piano majors.

MUS 1017. Bassoon Choir. Lab. 2. Credit 0-1.
Preparation of chamber music scores for instruments of the bassoon family.

MUS 1018. Saxophone Choir. Lab. 2. Credit 0-1.
Preparation of chamber music scores for instruments of the saxophone family.

MUS 1025. Wind Ensemble. Lab. 2. Credit 0-1.
Prerequisite: Successful audition. A select ensemble of wind and percussion instrumentalists.

MUS 1026. Varsity Pep Band. Lab. 2. Credit 0-1.
Public performance for varsity basketball games.

MUS 1033. Marching Band.-Fall. Lab. 4. Credit 0-1.
Preparation and performance for all home football games and other campus and community events.

MUS 1040. Symphony Band. Lab. 5. Credit 0-1.
Prerequisite: Successful audition. A wind band comprised of 60-80 instrumentalists.

MUS 1045. Concert Band. Lab. 4. Credit 0-1.
Prerequisite: Successful audition. A wind and percussion band; open to all students.

MUS 1050. Women's Chorus. Lab. 2. Credit 0-1.
Prerequisite: Successful audition. A choral performance ensemble for female voices, open to all University students.

MUS 1054. Men's Chorus. Lab. 2. Credit 0-1.
Prerequisite: Successful audition. A choral performance ensemble for male voices, open to all University students.

MUS 1060. Chorale. Lab. 5. Credit 0-1.
Prerequisite: Successful audition. A select choral ensemble.

MUS 1062. Madrigal Singers. Lab. 2. Credit 0-1.
Prerequisite: Successful audition. A select chamber ensemble open, by audition, to all university students. The ensemble will consist of 16 to 20 singers who will primarily perform music from the Renaissance period and will perform one "Madrigal Feaste" per school year.

MUS 1065. Mastersingers. Lab. 2. Credit 0-1.
A choral ensemble open to students and members of the community for the purpose of performing major choral works.

MUS 1070. Concert Choir. Lab. 3. Credit 0-1.
A large choral ensemble open to all university students.

MUS 1076. Beginning West African Drumming. Lec. 2. Credit 1.
Prerequisite: Consent of instructor. The performance of

drum rhythms and songs from Ghana and surrounding countries.

MUS 1077. Advanced West African Drumming. Lec. 2. Credit 1.
Prerequisite: MUS 1076. A continuation of the performance of drum rhythms and songs from Ghana and surrounding countries.

MUS 1078. Beginning West African Dance. Cross-listing: PHED 1250. Lab. 2. Credit 1.
Performance of dances and songs from Ghana and surrounding countries.

MUS 1079. Advanced West African Dance. Cross-listing: PHED 1260. Lab. 2. Credit 1.
Prerequisite: MUS 1078. A continuation of the performances of dances and songs from Ghana and surrounding countries.

MUS 1080. Bryan Symphony Orchestra. Lab. 2. Credit 0-1.
Prerequisite: Successful audition. A symphony orchestra including students, faculty and regional musicians.

MUS 1085. University Orchestra. Lab. 3. Credit 0-1.
An orchestra open to all university students, exploring repertoire for chamber and full symphony orchestra.

MUS 1090. Jazz Ensemble. Lab. 3. Credit 0-1.
Prerequisite: Successful audition. Organized instrumental groups rehearsing and performing music in the jazz and "Pop" idiom.

MUS 1091. Jazz Lab Band. Lab. 3. Credit 0-1.
An instrumental experience in the jazz/pop idiom; open to all students.

MUS 1111. Functional Performance Band. Lab. 2-5. Credit 1.
Corequisite: MUS 1025, MUS 1026, MUS 1033, MUS 1040 or MUS 1045. Techniques involved in preparation for public band performance.

MUS 1112. Functional Performance Choir. Lab. 2-5. Credit 1.
Corequisite: MUS 1060, MUS 1065 or MUS 1070. Techniques involved in preparation for public choral performance.

MUS 1113. Functional Performance Orchestra. Lab. 2-3. Credit 1.
Corequisite: MUS 1080 or MUS 1085. Techniques involved in preparation for public orchestral performance.

MUS 1114. Functional Performance Jazz.

Lab. 3. Credit 1.

Corequisite: MUS 1090 or MUS 1091. Techniques involved in preparation for public jazz performance.

MUS 3006. Opera Workshop. Lab. 2. Credit 0-1.

Prerequisite: Successful audition. Techniques of auditioning, staging, rehearsal and production of musical comedy and opera.

Music, Private Instruction (Lower Division)**MUS 1000. Private Composition.** Credit 1-2.**MUS 1100. Private Piano.** Credit 1-2.**MUS 1200. Private Voice.** Credit 1-2.**MUS 1300. Private Violin.** Credit 1-2.**MUS 1301. Private Violoncello.** Credit 1-2.**MUS 1302. Private String Bass.** Credit 1-2.**MUS 1303. Private Viola.** Credit 1-2.**MUS 1350. Private Harp.** Credit 1-2.**MUS 1400. Private Flute/Piccolo.** Credit 1-2.**MUS 1401. Private Oboe/English Horn.** Credit 1-2.**MUS 1402. Private Clarinet.** Credit 1-2.**MUS 1403. Private Bassoon.** Credit 1-2.**MUS 1404. Private Saxophone.** Credit 1-2.**MUS 1500. Private Trumpet.** Credit 1-2.**MUS 1501. Private Horn.** Credit 1-2.**MUS 1502. Private Trombone.** Credit 1-2.**MUS 1503. Private Tuba/Euphonium.** Credit 1-2.**MUS 1600. Private Organ.** Credit 1-2.**MUS 1700. Private Percussion.** Credit 1-2.**MUS 1800. Private Harpsichord.** Credit 1-2.**MUS 1900. Private Guitar.** Credit 1-2.**Music, Private Instruction (Upper Division)**

The completion of four semesters in the Lower Division is required for enrollment in the Upper Division. In addition, each applicant must be approved by the jury hearing his/her performance examination at the end of the fourth semester, and also by his/her private instructor before being allowed to register for study at the 3000-level. This course can be repeated for multiple credit.

MUS 3000. Private Composition. Credit 1-2.**MUS 3100. Private Piano.** Credit 1-2.**MUS 3200. Private Voice.** Credit 1-2.**MUS 3300. Private Violin.** Credit 1-2.**MUS 3301. Private Violoncello.** Credit 1-2.**MUS 3302. Private String Bass.** Credit 1-2.**MUS 3303. Private Viola.** Credit 1-2.**MUS 3350. Private Harp.** Credit 1-2.**MUS 3400. Private Flute/Piccolo.** Credit 1-2.**MUS 3401. Private Oboe/English Horn.** Credit 1-2.**MUS 3402. Private Clarinet.** Credit 1-2.**MUS 3403. Private Bassoon.** Credit 1-2.**MUS 3404. Private Saxophone.** Credit 1-2.**MUS 3500. Private Trumpet.** Credit 1-2.**MUS 3501. Private Horn.** Credit 1-2.**MUS 3502. Private Trombone.** Credit 1-2.**MUS 3503. Private Tuba/Euphonium.** Credit 1-2.**MUS 3600. Private Organ.** Credit 1-2.**MUS 3700. Private Percussion.** Credit 1-2.**MUS 3900. Private Guitar.** Credit 1-2.**MUS 3950. Junior Recital.** Credit 1.

Prerequisite: Consent of studio instructor. Corequisite: Enrollment in Upper Level Private Instruction in pertinent studio. Recital fee applies. The completion of four semesters in the Lower Division is required for enrollment in the Upper Division. In addition, each applicant must be approved by the jury hearing his/her performance examination at the end of the fourth semester, and also by his/her private instructor before being allowed to register for study at the 3000-level. Bachelor of Music in Performance majors must earn a grade of B or better to pass.

MUS 4000. Senior Recital. Credit 1.

Prerequisite: Consent of studio instructor. Corequisite: Enrollment in Upper Level Private Instruction in pertinent studio. Recital fee applies.

MUS 4400 (5400). Composition. Credit 1-2.**MUS 4500 (5500). Conducting.** Credit 1-2.**Music Education****MUED 1820. Introduction to Music Education.**

Lab. 3. Credit 1.

Prerequisite: MUS 1140 and MUS 1150. Introduction to the music education profession with emphasis on observing a variety of K-12 public school teaching/conducting settings. Music Education majors only.

MUED 3110. Materials and Methods in Music, Grades K-5.

Lec. 3. Lab. 1. Credit 3.

Prerequisite: Full admission to Teacher Education Program and MUS 1024. This course will explore materials, methods and techniques used in teaching general music to children in grades Kindergarten through five. Public school field experience required.

MUED 3130. Materials and Methods in Instrumental Music, Grades 6-12. Lec. 3. Lab. 1. Credit 3.

Prerequisite: Full admission to the Teacher Education Program and MUS 1024. Intended for the instrumental music education major, this course will explore a variety of materials, methods and techniques which can be used to build and maintain successful school band and

orchestra programs. Public school field experience required.

MUED 3140. Materials and Methods in Vocal Music, Grades 6-12. Lec. 3. Lab. 1. Credit 3.
Prerequisite: Full admission to the Teacher Education Program and MUS 1024. Intended for the vocal/general music education major, this course is directed towards developing a working knowledge of teaching strategies necessary for successful choral/general music programs. Public school field experience required.

MUED 3230. Marching Band Techniques.-Fall. Lec. 2. Credit 2.
Prerequisite: Full admission to the Teacher Education Program, MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUED 1820 with a grade of B. Group and individual drill maneuvers; music selection and arranging; and designing and charting for effective outdoor performances.

MUED 3620. Fundamentals of Conducting. Lec. 1. Credit 1.
Prerequisite: MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUED 1820 with a grade of B. Technique, practice and principles of conducting. Development of effective hand and baton techniques.

MUED 3630. Instrumental Conducting and Literature. Lec. 1. Lab. 2. Credit 2.
Prerequisite: MUED 3620. Technique, practice, and principles of instrumental conducting in performance through a study of the standard repertoire.

MUED 3640. Choral Conducting and Literature. Lec. 1. Lab. 2. Credit 2.
Prerequisite: MUED 3620. Technique, practice and principles of choral conducting in performance through a study of the standard repertoire.

MUED 3735. String Pedagogy and Literature I. Lec. 1. Lab. 2. Credit 2.
Techniques and methods used in developing a public school string education program.

MUED 3740. String Pedagogy and Literature II. Lec. 1. Lab. 1. Credit 1.
Survey of string literature from the 17th Century to the present, which is appropriate to the development of the public school string program.

MUED 3810. Practicum in Music Education I. Credit 1.
Corequisite: MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUED 1820 with a grade of B; and Full admission to the Teacher Education Program.

Supervised work experiences in the public schools stressing the translation of theory into practice.

MUED 3830. Practicum in Music Education II, Instrumental. Credit 1.
Prerequisite: Full admission to the Teacher Education Program, MUS 1024, MUS 2130, MUS 2140, MUED 3620, and Harmony/AT Exam; MUED 1820 with a grade of B. Corequisite: MUED 3130. Instrumental music education majors will have the opportunity to translate theory into practice through guided work experiences in the public schools.

MUED 3840. Practicum in Music Education II, Vocal. Credit 1.
Prerequisite: Full admission to the Teacher Education Program, MUS 1024, MUS 2130, MUS 2140, MUED 3620, and Harmony/AT Exam; MUED 1820 with a grade of B. Corequisite: MUED 3140. Intended for the vocal/general music education major, this course provides the student with practical teaching experience in secondary choral/general music classes.

MUED 4510. Special Problems. Lab. 4. Credit 1-2.
Prerequisite: Consent of appropriate area coordinator. Work in a field approved by the coordinator.

MUED 4520. Special Problems. Lab. 4. Credit 1-2.
Prerequisite: Consent of appropriate area coordinator. Work in a field approved by the coordinator.

MUED 4850 (5850). Workshop in Music Education. Credit 1-3.
Laboratory approach providing opportunities for experienced music education personnel to study in depth music education problems.

MUED 4870. Student Teaching in Music I. Credit 5.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: MUED 4880 and MUED 4890. Activities directly related to teaching performance; planning and presenting lessons, directing study, and managing the classroom and rehearsal. A grade of B is required to meet degree requirements.

MUED 4871. Residency I. Credit 5.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: MUED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A grade of B is required to meet degree requirements.

MUED 4872. Professional Seminar I. Credit 5.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: MUED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

MUED 4880. Student Teaching in Music II. Credit 5.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: MUED 4870 and MUED 4890. Study of personal-professional characteristics, human relations skills, and educational philosophy in teaching. A grade of B is required to meet degree requirements.

MUED 4881. Residency II. Credit 10.
Prerequisite: Full admission to the Teacher Education Program, and MUED 4871 with a grade of B. Corequisite: MUED 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

MUED 4882. Professional Seminar II. Credit 2.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: MUED 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

MUED 4890. Seminar: Education and Society. Credit 2.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: MUED 4870 and MUED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Music Therapy (MUST)

MUST 1220. Basic Techniques of Music Therapy. Lec. and Lab. 2. Credit 1.
Prerequisite: MUST major. Beginning skills for music therapy: song accompaniment, teaching and leading; song repertoire development; group leadership skills; basic instrumental skills.

MUST 2110. Introduction to Music Therapy. Lec. 3. Credit 3.
Overview of the field of music therapy; therapeutic

applications of music. Professional aspects of the discipline.

MUST 2220. Intermediate Techniques of Music Therapy. Lec. and Lab. 2. Credit 1.
Prerequisite: MUST major; MUST 1220 or consent of instructor. Teaching and modeling techniques; therapy techniques: relaxation with music, songwriting, musical improvisation, song arranging for ensembles, song repertoire development.

MUST 2310. Clinical Orientation. Lec. 2. Credit 2.
Prerequisite: MUST major; MUST 2110 with a grade of C or better. The music therapy treatment process and related clinical skills.

MUST 3220. Advanced Techniques of Music Therapy. Lec. and Lab. 2. Credit 1.
Prerequisite: MUST major; MUST 1220, MUST 2220 or consent of instructor. Advanced group leadership techniques and music therapy procedures, including: lyric discussion, client songwriting, advanced improvisation. Group process; music therapy with various treatment models.

MUST 3520. Psychology of Music. Lec. 3. Credit 3.
Human musical behavior, auditory perception, emotional response to music; reading and evaluating research literature in psychology of music.

MUST 3530. Music Therapy Research. Lab. 2. Credit 1.
Prerequisite: MUST major with grade of C or better in MUST 3520; admission to Professional Level. Research designs and models; assigned project in music therapy/music psychology research.

MUST 4110. Special Topics in Music Therapy. Lab. 4. Credit 2.
Prerequisite: Consent of Director of Music Therapy. Individualized study in an area of music therapy research or clinical practice approved by the instructor.

MUST 4220. Music Therapy Theory and Practice I. Lec. 3. Credit 3.
Prerequisite: MUST major; admission to Professional Level. Theory and applications of music therapy with identified conditions and disabilities. Study of professional issues.

MUST 4230. Music Therapy Theory and Practice II. Lec. 3. Credit 3.
Prerequisite: MUST major; admission to Professional Level. Theory and applications of music therapy with identified conditions and disabilities. (Continuation of MUST 4220.)

MUST 4510. Practicum in Music Therapy.

Credit 5.

Prerequisite: MUST major; consent of Director of Music Therapy. Supervised clinical field work in music therapy. Setting, clients and skill-development levels to be designated in consultation with instructor.

MUST 4610. Internship in Music Therapy.

Lab. 12. Credit 6.

Prerequisite: MUST major; completion of all required on-campus course work. A six-month (1040 hours) internship at an AMTA-approved training site.

Nursing (NURS)**NURS 1020. First-Year Connection: University and Nursing.**

Credit 1.

Prerequisite: First-time college student, minimum ACT score of 20 and high school GPA 3.00. A course designed to enhance connection of the first-time college student with the University and to nursing. This course is designed to augment skills required for academic success through academic and non-academic out-of-classroom activities.

NURS 2300. Introduction to Professional Nursing Concepts I.

Lec. 2. Credit 2.

Historical perspectives, mathematics, and terminology basic to nursing; critical thinking and professional communication; and roles of the professional nurse.

NURS 3240. Pharmacological Concepts in Nursing I.

Lec. 3. Credit 3.

Prerequisite: Admission to Upper Division Nursing. Introduction to drug classifications, mechanisms of action, and management of medications. Includes study and test-taking skills.

NURS 3250. Medical Surgical Nursing I.

Lec. 4. Credit 4.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Corequisite: NURS 3280. Concepts of psychosocial and physiological aspects of health/illness and therapeutic communication.

NURS 3260. Health Assessment and Promotion.

Lec. 2. Credit 2.

Prerequisite: Admission to Upper Division Nursing. Corequisite: NURS 3261. Introductory course to health assessment will focus on comprehensive data collection through history and physical examination.

NURS 3261. Health Assessment and Promotion Lab.

Lab. 1. Credit 1.

Prerequisite: Admission to Upper Division Nursing. Corequisite: NURS 3260. Lab experience focuses on the

integration and application of the psychomotor skills necessary for assessing the health status of clients.

NURS 3270. Fundamentals of Nursing.

Lec. 2. Credit 2.

Prerequisite: Admission to Upper Division Nursing. Corequisite: NURS 3271. Course is designed to introduce the student to basic concepts, principles and skills necessary for building an effective nursing practice. Nursing process is introduced as a foundation for future clinical application.

NURS 3271. Fundamentals of Nursing Lab.

Lab. 1. Credit 1.

Prerequisite: Admission to Upper Division Nursing. Corequisite: NURS 3270. Introductory course in nursing designed to teach the student basic clinical skills and apply the process of critical thinking.

NURS 3280. Medical Surgical Nursing I: Lab.

Lab. 9. Credit 3.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Corequisite: NURS 3250. Performance of nursing skills in lab and clinical settings based on principles of nursing process and practice.

NURS 3281. Health Assessment and Promotion.

Lec. 2. Lab. 1. Credit 3.

This course is an introduction to health assessment based on an understanding of anatomy and physiology and social sciences. The focus is on comprehensive data collection through history and physical examination.

NURS 3290. Pathophysiological Processes for the Professional Nurse I.

Lec. 2. Credit 2.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Focus on the physiological responses to various common diseases, disorders, and disruptions affecting humans.

NURS 3350. Medical Surgical Nursing II.

Lec. 4. Credit 4.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Corequisite: NURS 3361. Medical-surgical nursing concepts including communication skills, teaching/learning principles, ethical/legal, and economic issues.

NURS 3360. Medical Surgical Nursing II.

Lec. 5. Credit 5.

Corequisite: NURS 3361. Medical-surgical nursing concepts; also including communication skills, teaching/learning principles, ethical/legal, and economic issues.

NURS 3361. Medical Surgical Nursing II: Lab.

Lab. 9. Credit 3.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Corequisite: NURS 3350. Emphasizes the application of the nursing process in a variety of medical-surgical clinical settings.

NURS 3370. Mental Health Nursing.

Lec. 3. Credit 3.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Corequisite: NURS 3371. Basic mental health nursing concepts; also including communication skills, teaching/learning principles, ethical/legal, and economic issues.

NURS 3371. Mental Health Nursing: Lab.

Lab. 6. Credit 2.

Prerequisite: NURS 3240, NURS 3260, NURS 3261, NURS 3270 and NURS 3271. Corequisite: NURS 3370. Emphasizes the application of the nursing process in a variety of mental health clinical settings.

NURS 3380. Pathophysiological Processes for the Professional Nurse.

Lec. 3. Credit 3.

This course will examine the outcomes of disruption of normal physiology; the alterations and mechanisms involved in the disruption; and the manifestations in disease and at risk conditions. Major diseases will be explored, in part by using a conceptual approach. The focus of the course is to provide the professional nurse with an understanding of pathophysiological principles as the basis for nursing assessment and therapeutic intervention.

NURS 3390. Pathophysiological Processes for the Professional Nurse II.

Lec. 2. Credit 2.

Prerequisite: NURS 3290. Focuses on physiological responses to acute and critical diseases, disorders, and disruptions affecting humans.

NURS 3430. Survey of Pharmacological Aspects of Nursing.

Lec. 3. Credit 3.

Prerequisite: NURN standing or permission of the instructor. Review and update of major drug groups, and administering drugs, and intravenous solutions with implications for nursing practice.

NURS 3465. Bridging to Professional Nursing Practice.

Credit 4.

An online course designed for RN's to bridge the gap between technical skills and professional nursing practice by focusing on self analysis and validation of one's own ability to utilize critical thinking, communication, and therapeutic intervention in nursing practice and to identify improvement areas for lifelong learning in a changing healthcare environment.

NURS 4000. Women's Health and Perinatal Nursing.

Lec. 3. Credit 3.

Prerequisite: NURS 3261, NURS 3290 and NURS 3350. Corequisite: NURS 4001. This course focuses on concepts of professional nursing care of women in their childbearing years and their families. This course encompasses knowledge of growth and development, culture, family, and pathophysiology from the natural and social sciences, and liberal arts in assessing, implementing, and evaluating the health needs of these populations.

NURS 4001. Women's Health and Perinatal Nursing: Lab.

Lab. 6. Credit 2.

Prerequisite: NURS 3261, NURS 3290 and NURS 3350. Corequisite: NURS 4000. This course focuses on implementation of the nursing process with women in their childbearing years and their families. This course applies knowledge of growth and development, culture, family, and pathophysiology from the natural and social sciences, and liberal arts in assessing, implementing and evaluating the health needs of these populations.

NURS 4100. Nursing Care of Children.

Lec. 3. Credit 3.

Prerequisite: NURS 3261, NURS 3290 and NURS 3350. Corequisite: NURS 4101. This course focuses on concepts of professional nursing care of children and their families. This course encompasses knowledge of growth and development, culture, family, and pathophysiology from the natural and social sciences, and liberal arts in assessing, implementing and evaluating the health needs of these populations.

NURS 4101. Nursing Care of Children: Lab.

Lab. 6. Credit 2.

Prerequisite: NURS 3261, NURS 3290 and NURS 3350. Corequisite: NURS 4100. This course focuses on implementation of the nursing process with children and their families. This course applies knowledge of growth and development, culture, family and pathophysiology from the natural and social sciences and liberal arts in assessing, implementing, and evaluating the health needs of these populations.

NURS 4230. Pharmacological Concepts in Nursing II.

Lec. 2. Credit 2.

Continued study of the major drug groups with emphasis on the responsibility of the nurse in medication administration, patient education, and health promotion.

NURS 4300. Research in Health Care.

Lec. 3. Credit 3.

Prerequisite: NURS 3250, NURS 3280 or permission of instructor. Study the research process with development and presentation of a completed research proposal.

NURS 4350. Health Care of Communities (for RN-BSN Students). Lec. 4. Credit 4.

Corequisite: NURS 4351. Focus on the dynamics and nursing needs of individuals, families, communities, national, and international groups (for RN-BSN Students.)

NURS 4351. Health of Communities: Lab (for RN-BSN Students). Lab. 9. Credit 3.

Prerequisite: NURS 4000, NURS 4001, NURS 4100 and NURS 4230. Corequisite: NURS 4430. Organization and delivery of nursing care to individuals, families, and groups in a variety of community health care settings (for RN-BSN Students.)

NURS 4430. Health Care of Communities.

Lec. 3. Credit 3.

Prerequisite: NURS 4000, NURS 4001, NURS 4100 and NURS 4230. Corequisite: NURS 4431. Focus on the dynamics and nursing needs of individuals, families, communities, national, and international groups.

NURS 4431. Health Care of Communities: Lab.

Lab. 9. Credit 3.

Prerequisite: NURS 4000, NURS 4001, NURS 4100, NURS 4101 and NURS 4230. Corequisite: NURS 4430. Organization and delivery of nursing care to individuals, families, and groups in a variety of community health care settings.

NURS 4450. Leadership and Management.

Lec. 3. Credit 3.

Prerequisite: NURS 4000, NURS 4001, NURS 4100 and NURS 4230. Corequisite: NURS 4451. Introduction to concepts of leadership and management in nursing; preparation for role transition from student to graduate.

NURS 4451. Leadership and Management: Lab.

Lab. 12. Credit 4.

Prerequisite: NURS 4000, NURS 4001, NURS 4100 and NURS 4230. Corequisite: NURS 4450. Clinical experiences applying concepts of management and leadership.

NURS 4460. Preparation for Licensure.

Lec. 1. Credit 1.

Corequisite: Senior 2 status or permission from the instructor. Preparation for success on the National Registered Nurse Licensure Exam.

NURS 4800. Gerontological Nursing.

Lec. 2. Credit 2.

Prerequisite: NURS 3250, NURS 3270, NURS 3271, NURS 3280 and NURS 3290. Physical and psychosocial processes affecting nursing the older patient.

Nursing, Electives

NURS 3000. Ethics of Nursing Practice.

Lec. 1. Credit 1.

Prerequisite: Admission to Upper Division Nursing; concurrent enrollment; or permission of instructor. An elective course that provides an introduction to the ethical principles that guide nursing practice. Students will examine current ethical issues encountered in nursing practice in the context of the healthcare setting.

NURS 3010. Managing the End of Life.

Lec. 1. Credit 1.

Prerequisite: Admission to Upper Division Nursing; concurrent enrollment; or permission of instructor. The role of culture, palliative and hospice care, family dynamics, advance directives, and spirituality encountered during death and dying will be described. Interactions, healing strategies, and rituals that use the senses and bring comfort and peace for the dying will also be explored.

NURS 3020. The Merging of Two Worlds: Spirituality and Healthcare.

Lec. 1. Credit 1.

Prerequisite: Admission to Upper Division Nursing; concurrent enrollment; or permission of instructor. This course is designed for students in the healthcare disciplines. To provide a holistic perspective of how spirituality and religion impact health and resultant healthcare decisions.

NURS 3030. Cultural Sensitivity in the Healthcare Setting.

Lec. 1. Credit 1.

Prerequisite: Admission to upper division nursing; concurrent enrollment; or permission of instructor. Introduction to diverse cultures and promotion of the development of cultural sensitivity in health care.

NURS 3040. Collaborative Care: Nurses' Role in the Healthcare Team.

Lec. 3. Credit 3.

This course examines the role of the interdisciplinary health care team to make a difference in the lives of patients. It prepares the student to contribute in significant ways to safe and effective care within a multidisciplinary team.

NURS 3050. Pediatric Illnesses and Related Care.

Lec. 1. Credit 1.

This course provides a study of the more common illnesses of the pediatric population requiring inpatient treatment.

NURS 3060. Breastfeeding and Lactation Management.

Lec. 2. Credit 2

This elective course in nursing for students of all disciplines is designed to introduce and provide in-depth knowledge on breastfeeding and human lactation.

NURS 3450. Personal Wellness Management.

Lec. 3. Credit 3.

Holistic approach to assisting individuals in the promotion of wellness including: health guidance, nutrition, stress reduction, and fitness.

NURS (LIST, SPED) 4050. Sign Language I.

Lec. 3. Credit 3.

Introduction to and development of a basic vocabulary in Signed English concepts in the use of alternative methods of communication.

NURS 4090. Sign Language II.

Lec. 3. Credit 3.

Prerequisite: NURS 4050. Continuation of vocabulary development in Signed English and appreciation of practical situations in various professional fields.

NURS 4240. Clinical Immersion at Disciplinary Interfaces.

Ind. 3. Credit 3.

Prerequisite: Nursing students: Junior or Senior Standing or consent of instructor. Chemical Engineering students: Junior or Senior standing in Chemical Engineering or consent of instructor. This course focuses on team-based identification of unmet medical needs and development of robust solutions. Select disease conditions will be discussed and technologies used to address those conditions will be examined. Students will participate in simulation lab and clinical immersion for experiential learning in hospitals, urgent care facilities, assisted living facilities, senior citizen centers, and/or other healthcare settings.

NURS 4360. Oncology Nursing.

Lec. 3. Lab. 1. Credit 3.

Prerequisite: Consent of instructor. Focus on oncology nursing and hospice concepts used to provide care for the clients with cancer in a community or institutional setting.

NURS 4370. Preparation for Parenting.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing or consent of instructor. Focus on parenting skills with infants and children and labor, delivery, and newborn care.

NURS 4400. Introduction to Critical Care Nursing.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Developing critical care assessment skills, emphasizing nursing decision-making, problem-solving, and intervention.

NURS 4410. Cardiorespiratory Intensive Care.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Care of clients with cardiovascular and respiratory deficits requiring invasive, therapeutic nursing interventions; cardiac dysrhythmias.

NURS 4500. School Health Nursing.

Credit 3.

Prerequisite: Senior Nursing major or RN degree. Introduction to school health nursing and the role of the school nurse as caregiver, coordinator, manager, consultant, and leader. This course provides registered nurses with the necessary beginning skills to manage a comprehensive school health program.

NURS 4610. Summer Clinical Extern.

Credit 3.

Prerequisite: NURS 3350 and NURS 3361. Skill-oriented clinical experience based on nursing process in the clinical area of the acute care or extended care facility.

NURS 4700. Adventures in Global Awareness: Expanding Cultural Sensitivity.

Sem. 1. Lab. 6. Credit 3.

The course provides a trans-cultural experience through international travel and self-exploration to increase personal and cultural awareness, sensitivity, and respect.

NURS 4810. Concepts of Gerontology.

Cross-listing: PSY 4810 (5810), SOC 4810.

Lec. 3. Credit 3.

Prerequisite: PSY 2130, PSY 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adult.

NURS 4981. Independent Study.

Credit 1.

Prerequisite: Admission to Upper Division Nursing; concurrent enrollment; or permission of instructor. Allows the student to undertake study in an area (topic) of nursing where there is not appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

NURS 4982. Independent Study.

Credit 2.

Prerequisite: Admission to Upper Division Nursing; concurrent enrollment; or permission of instructor. Allows the student to undertake study in an area (topic) of nursing where there is not appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

NURS 4983. Independent Study.

Credit 3.

Prerequisite: Admission to Upper Division Nursing; concurrent enrollment; or permission of instructor. Allows

the student to undertake study in an area (topic) of nursing where there is not appropriate course. Students may take a total of up to 6 hours of independent study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

NURS 4990. Special Topics. Credit 1-3.
Directed study and research on a selected topic. Available to students on an individual basis, with consent of the Dean, as faculty load permits.

NURS 4991-4999. Special Topics. Credit 1-3.
Directed study and research on a selected topic. Available to students on an individual basis, with consent of the Dean, as faculty load permits. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit.

Philosophy (PHIL)

◆ **PHIL 1030. Introduction to Philosophy.** Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Introduction to central problems of the nature of humanity, ethics, religion, justice, and knowledge of reality.

PHIL 2100. Introductory Logic. Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Consideration of uses of language, definition, and informal fallacies; forms of valid deductive argument; elementary propositional logic; and inductive arguments.

PHIL 2250. Introductory Ethics. Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Appraisal of conduct and moral reasoning by the study of traditional theories of the good life and their bearing upon contemporary moral issues.

PHIL 3010. Philosophy of Religion. Lec. 3. Credit 3.
Prerequisite: Junior Standing. Consideration of religious issues such as the nature of religious experience, existence and nature of God, verification of religious claims, and evil and human destiny.

PHIL 3310. History of Ancient and Medieval Philosophy. Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Study of the most important philosophical systems which developed in the Mediterranean areas in Western Europe from the time of Socrates through St. Thomas Aquinas.

PHIL 3320. History of Modern Philosophy. Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Study of selected philosophical systems which developed in the Western World from the 1500s to the time of the 20th century.

PHIL 4010. The Nature of Knowledge. Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Issues and problems concerning the nature and scope of knowledge: truth and evidence, skepticism and certainty, memory, and perception.

PHIL 4020. Comparative Religion. Lec. 3. Credit 3.
Prerequisite: Completion of two semesters of college work. Study of the great world religions with an emphasis on the distinctive concepts of each.

PHIL 4950. Independent Study. Credit 1-3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of philosophy where there is no appropriate course. May be taken twice, provided the topic is different.

PHIL 4960. Special Topics. Credit 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue or interest area in philosophy.

◆ **Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).**

Physical Education, Activity Courses (PHED)

PHED 0900. Conditioning and Agility. Credit 1.
This course is designed for people interested in learning the importance of athletic conditioning and agility. Focus is on improving cardiovascular health, coordination, and explosive skills involved in athletics, every day activity, and overall health.

PHED 1000. Modified Seasonal Sports. Credit 1.
This course is designed for students to learn and understand modifications that are available for an assortment of sporting activities. Students will learn to modify equipment and design rules and regulations that meet the needs of individuals with physical or mental disabilities.

PHED 1002. Physical Fitness Test. Credit 0.
This course is designed to facilitate all majors in the Exercise Science, Physical Education and Wellness department in tracking and timely completion of the required (once per academic year) physical fitness test. The course is intended to ensure quality

participation/completion of the yearly fitness test and to aid students in keeping track of when to take the test. Six components of physical fitness are evaluated expecting a health enhancing level of fitness in five of the six areas tested. Cardiovascular endurance, muscular endurance, muscular strength, flexibility, body composition and muscular power are included in the test battery. Using this format, students will (1) be given multiple opportunities to learn about each individual assessment piece, (2) have more individualized instruction on best practices for improving in any/all areas of fitness, (3) have monitored practice opportunities prior to the actual testing date, (4) be allowed to remediate and retest in areas that are not passed.

PHED 1005. Lifetime Fitness and Wellness.

Credit 2.

This course is designed to explore and apply principles of lifetime physical fitness, with a key focus on optimal wellness, nutrition and disease prevention. Online delivery method.

PHED 1010. Tennis.

Credit 1.

This course is designed for students to learn how to play the game of tennis. Basic strokes of tennis will be covered, including forehand, backhand, and the serve. Court dimensions and markings as well as singles and doubles rules of game play will be included. Upon completion of this class, students should feel confident in their skills to participate in recreational tennis.

PHED 1011. Intermediate Tennis.

Credit 1.

PHED 1015. Beginning Yoga.

Credit 1.

This course is designed for the student who has little or no prior experience practicing yoga. Simple yoga poses and controlled breathing techniques are included to calm the mind and strengthen the body. Students will need to have their own yoga mat.

PHED 1020. Swimming.

Credit 1.

This course is designed for non-swimmer or beginning swimmers to develop skills of swimming. Swimming pool/water safety will be addressed and students will learn to float and execute swim strokes including but not limited to the front crawl, back crawl and elementary backstroke.

PHED 1021. Intermediate Swimming.

Credit 1.

This course is for students with moderate to advanced swimming skills. Advanced swim strokes will be taught and students will participate in endurance swimming.

PHED 1025. Advanced Yoga.

Credit 1.

This course is designed for students who have experience practicing yoga. More advanced yoga poses and controlled breathing techniques are included to calm the mind and strengthen the body. Students will need to have their own yoga mat.

PHED 1030. Bowling (fee).

Credit 1.

This course is designed for students who have no prior knowledge of bowling to gain the necessary skills needed to successfully participate in bowling. Students will learn proper techniques, bowling etiquettes and score keeping. After completing this course students should have a clear understanding of bowling.

PHED 1031. Advanced Bowling.

Credit 1.

This course is designed for students who have a basic knowledge of bowling and builds on the skills learned in PHED 1030. Advanced bowling includes a brief review of proper form, different techniques and etiquette. Students will become competent in these skills in class and outside of the classroom.

PHED 1035. Pickleball.

Credit 1.

This course is for students who enjoy racket/paddle games. Pickleball is a net game that is similar to tennis and ping pong. Played on a court similar to badminton, pickleball is played with a wooden paddle and a plastic ball – like a wiffleball. Skills and rules are easy to learn and pickleball a fun and competitive way to be active.

PHED 1040. Archery (fee).

Credit 1.

This course is designed for people looking for a place to learn about and potentially begin the hobby of archery. This is an off-campus course, which focuses on the history, safety, variations of bows, variations of arrows, and skills associated with beginning archery.

PHED 1050. Basketball for Women.

Credit 1.

This course introduces the fundamental skills of basketball for women. Emphasis is placed on skill development, rules and fair play. Dribbling, passing, shooting and offensive and defensive strategies are among skills that will be focused on throughout the duration of the class. The main goal of the class is to strive for improvement in every aspect of the game of basketball.

PHED 1070. Volleyball.

Credit 1.

This course is designed to help students learn to play the game of volleyball using the proper technique, strategies and scoring. Students will demonstrate the skills of passing, setting and serving, as well as the knowledge of rotations of the players and each position's responsibilities, and how to keep score.

PHED 1080. Racquetball and Handball (fee).

Credit 1.

This course is designed to provide students with the knowledge and skill development necessary to be successful in playing racquetball and/or handball. Offensive and defensive strategies and scoring are also addressed.

PHED 1090. Softball.

Credit 1.

This course is designed to help students learn to play the game of softball using proper skills, strategies, and scoring. Students will become familiar with throwing, catching, and hitting in addition to rules and terminology. By the end of the semester students should have a basic understanding of the game of softball and feel confident in recreational game play.

PHED 1100. Golf (fee).

Credit 1.

This course is designed to give students the opportunity to learn the basic strokes and rules of game play for golf. Which clubs to use when and score keeping are included.

PHED 1101. Advanced Golf (fee).

Credit 1.

This course is for students who have completed PHED 1100 or have basic golf skills. Continuing to improve strokes and perfect golf skills as well as gaining knowledge of game play strategies is included.

PHED 1110. Badminton.

Credit 1.

This course is designed to give students basic information about the game/sport of badminton. Skill development, basic knowledge, rules and strategies of play for singles and doubles play are included in the course. Strokes and scoring are major components of this course.

PHED 1120. Ballroom Dance.

Credit 1.

Ballroom dance class is designed to help students learn basic to advanced ballroom dance steps, including but not limited to Foxtrot, Cha Cha, Rumba, Waltz and Tango. This class is appropriate for all levels of ballroom dancers. Students enjoy a culminating BALL at the end of each semester.

PHED 1150. Riflery (fee).

Credit 1.

This course is designed for people interested in the hobby of riflery. This course is based on recreational riflery, and covers topics such as; safety, rifle uses, recreational riflery, ammunition, sights, reloading, and competitive riflery rules/regulations.

PHED 1160. Scuba and Skin Diving (fee).

Credit 1.

This course is designed for students who want to learn to scuba/skin dive. Students spend time in the classroom and in the pool checking off on skills and

practice diving before going out for a 'check off' dive. Students can become certified divers in this class.

PHED 1170. Karate.

Credit 1.

This course is designed for students who are interested in karate with little or no background in martial arts. Beginners are encouraged to sign up for this course and start training in martial arts.

PHED 1171. Kempojutsu - Close quarters combat methods.

Credit 1.

The "Way of the Fist Methods" is the base martial arts of several systems taught today. This system is oriented toward those who would like an in-depth study of "Close Quarters Defensive Tactics". The program emphasizes practical martial arts methods-no hold high kicks and no forms to learn.

PHED 1172. Tai Chi/Qigong.

Credit 1.

Tai Chi is an ancient Chinese form of "Moving Meditation" and relaxation. Its movements achieve harmony and balance between the mind and body. The movements are designed to help you feel relaxed, yet alive and energized. Qigong is also known as "Energy Exercise". The practice of Qigong is done in place and relates more toward internal energy and health.

PHED 1173. Samurai Sword-iaijutsu/kenjutsu.

Credit 1.

The Samurai sword is the most notable weapon of the Japanese samurai warriors. Iaijutsu is the drawing of the sword. Kenjutsu is the collection of follow-on techniques after the draw. The student will learn numerous fighting skills of the samurai warriors. Classes will be taught using a bokken (wooden sword).

PHED 1180. Self-Defense for Women.

Credit 1.

The "Way of the Fist Methods" is the base martial arts of several systems taught today. This system is oriented toward those who would like an in-depth study of "Close Quarters Defensive Tactics". The program emphasizes practical martial arts methods-no hold high kicks and no forms to learn. Techniques are tailored to meet each individual's needs. Instruction is conducted in a friendly, self-paced learning environment. Unusual physical ability and flexibility are not required for the program.

PHED 1190. Water Aerobics.

Credit 1.

This class is designed to use the natural resistance of water against your body to provide a wide variety of conditioning activities: including but not limited to swimming, stretching, yoga, running, water weight exercises, and more. The purpose is to provide students with water aerobic exercises that will help reduce unnecessary stress on joints.

PHED 1200. Beginning Foil Fencing. Credit 1.

This course is for students who are interested in learning about foil fencing.

PHED 1220. Active Lifestyles and Health.

Lec. 1. Credit 1.

This course is designed for students to have multiple opportunities to participate in a variety of sports and physical activities in pursuit of a healthy lifestyle. Health topics including but not limited to physical fitness and nutrition will be covered.

PHED 1221. Fitness Walking. Credit 1.

PHED 1230. Map Reading/Orienteering. Credit 1.

This course is for students who are interested in learning about navigating by map reading and orienteering. There will be an equal amount of classroom work and hands on experience.

PHED 1240. Soccer. Credit 1.

This course is designed for beginners as well as seasoned players to be able to participate in the game of soccer. Basic skills and drills will be used to teach or reinforce necessary soccer skills. In addition, rules of play, positions and offensive and defensive strategies will be covered. By the end of the course, students should feel confident in participating in recreational soccer.

PHED (MUS 1078) 1250. Beginning West African Dance. Credit 1.

This course provides students with the history and basic principles of West African Dance. Through brief lecture, active participation, and group exercises, students will gain an understanding of the West African Culture and its dance origin.

PHED (MUS 1079) 1260. Advanced West African Dance. Credit 1.

This course provides students with an in-depth study of West African Culture and advanced technical dance routines and implications.

PHED 1290. Basketball for Men. Credit 1.

This course introduces the fundamental skills of basketball. Emphasis is placed on skill development, rules and fair play. Dribbling, passing, shooting and offensive and defensive strategies are among skills that will be focused on throughout the duration of the class. The main goal of the class is to strive for improvement in every aspect of the game of basketball.

PHED 1360. Slimnastics and Aerobics. Credit 1.

This class is designed to provide multiple and diverse opportunities for the student to exercise/workout in many

different ways: including but not limited to yoga, circuit training, cross fit, exercise videos and more. The purpose is to provide many avenues of exercise so students might find something they enjoy and that fits into their ongoing exercise routine.

PHED 1370. Weight Training and Physical Fitness.

Credit 1.

This course offers training, instruction and practice in proper techniques of the development of muscular strength, endurance, and flexibility. Emphasis is placed on the application of scientific principles and methods used to build, improve and maintain proper muscular fitness. Body composition and nutrition for health and fitness are also discussed. After taking this course students should be able to apply common knowledge into individual workout plans.

PHED 1371. Advanced Weight Training and Physical Fitness.

Credit 1.

This course reviews the fundamentals of proper technique of weight training and provides for continued improvement in strength, endurance, and flexibility. Students will set workout goals and apply knowledge to individualized workout routines.

PHED 1372. Weight Training and Physical Fitness for Women.

Credit 1.

This course offers training, instruction and practice in proper techniques of the development of muscular strength, endurance, and flexibility for women. Emphasis is placed on the application of scientific principles and methods used to build, improve and maintain proper muscular fitness. Body composition and nutrition for health and fitness are also covered.

PHED 1374. Cross Training. Credit 1.

This class combines cardiovascular exercises to raise your heart rate and burn calories with resistance exercises to tone and sculpt your muscles. This total body class combines compound exercise training with isolated muscle group training, to give a total body workout.

PHED 1390. Firearm Safety, Hunting and Outdoorsmanship.

Credit 1.

A course offered for people interested in becoming knowledgeable about firearms, hunting, and outdoorsmanship. The course covers topics such as the dangers of firearms, TWRA and national guidelines of hunting, as well as respectful conduct when hunting or being involved in outdoor activity.

PHED 1440. Skeet and Trap Shooting (fee).

Credit 1.

A course offered for those interested in learning the basics of skeet and trap shooting. This is an off-campus course. The course covers basic shotgun safety, ammunition, loading and reloading of shotgun shells, rules and regulations of competitive skeet and trap shooting.

PHED 1441. Skeet and Trap Shooting Competition (fee).

Credit 1.

A course offered for those who regularly engage in competitive skeet and trap shooting, or as an extension class of PHED 1441. This course solely focuses on competitive skeet and trap shooting and participates in competitions.

PHED 1470. Handgun Familiarization and Safety (fee).

Credit 1.

A course offered for people seeking knowledge about handgun safety, or interested in acquiring their Tennessee Handgun Carry Permit. This course covers topics such as; safety and dangers affiliated with handguns, political issues regarding handguns, ammunition, reloading, targeting, and the Tennessee Handgun Carry Permit written test and shooting test.

PHED 1505. Divemaster.

Credit 2.

Prerequisite: Pre-requisite – Minimum age 18; Certified SDI Advanced Adventure Diver or equivalent; Advance certification must include verifiable experience in deep, navigation, night, and limited vision specialties; Certified SDI Rescue Diver or equivalent; CPR certified and current; Proof of 40 logged dives/hours. This course is the next in the scuba diving series of certifications, that once successfully completed will lead to divemaster certification.

PHED 1540. Rescue Diver. Lec. 1. Lab 2. Credit 2.

This course is designed for the advanced diver to develop the knowledge base and necessary skill set to effectively perform diver rescues as well as assist in and administer necessary first aid in the event of an emergency. Skills such as how to perform self-rescues, buddy rescues, recognize and calm potential panic divers, administer proper first aid to divers that have experienced dive related injuries, conduct effective search patterns and manage accident scenes are included. Rescue Diver Certification is available at the conclusion of this course.

PHED 1590. Back Country Adventure I. Credit 1.

This course is designed for students to gain basic knowledge and skills to be able to participate safely in back-country adventures. Certain criteria must be met in

order to participate in the off campus back country adventure trip.

PHED 1600. Back Country Adventure II. Credit 1.

This course is an advanced course in back-country. Students will participate in relevant planning, practice and skill development to prepare for an extended back-country adventure trip.

PHED 1610. Challenge Course-Team Building Facilitation.

Credit 2.

This course is designed to provide the student with the knowledge and skills necessary to participate in and facilitate challenge course programs in various settings. Basic team building skills and challenges will be included.

PHED 1620. Boulderling Movement and Technique.

Credit 1.

This course is designed to covers the basics of safe and responsible boulderling. Topics include equipment, boulderling techniques, safety procedures, injury prevention, and training for competitive climbing.

PHED 1630. Basic Caving.

Credit 1.

This course is designed to introduce students to the basics of rope climbing and rappelling. Knots, types of rope, various climbing systems, rigging, rappelling, belaying, and climbing will be the focus of the course. Proper techniques will be emphasized with safety as the main priority.

PHED 1640. Mountain Bike Skills.

Credit 1.

This course is designed as an introduction to the basics of mountain biking. Students will be introduced to the basic equipment, techniques, terminology, and safety necessary to go mountain biking.

PHED 1650. Outdoor Water Skills.

Credit 1.

This course is designed for students to gain the knowledge and skills needed to safely enjoy a variety of water activities including but not limited to canoeing for recreation, relaxation, lifetime physical fitness or work.

PHED (EXPW) 2100. Life Guard Training. Credit 2.

The purpose of the American Red Cross Lifeguarding course is to provide entry-level lifeguard participants with the knowledge and skills to prevent, recognize and respond to aquatic emergencies and to provide care for breathing and cardiac emergencies, injuries and sudden illnesses until emergency medical services (EMS) personnel take over.

PHED (EXPW) 3050. Water Safety Instructor's Course. Credit 2.

Physical Education, Physical Activity Courses for Varsity Athletes and Cheerleaders

Only varsity athletes and cheerleaders may enroll. Those who are working toward licensure in Health and Physical Education may use only one credit hour of the Varsity Sports series for licensure purposes. Only three semesters of varsity sports can be taken without a repeat card.

PHED 1870. Varsity Softball. Credit 1.

PHED 1880. Varsity Riflery. Credit 1.

PHED 1900. Varsity Volleyball. Credit 1.

PHED 1910. Varsity Football. Credit 1.

PHED 1920. Varsity Basketball for Men. Credit 1.

PHED 1923. Varsity Basketball for Women. Credit 1.

PHED 1930. Varsity Baseball. Credit 1.

PHED 1940. Varsity Tennis for Men. Credit 1.

PHED 1943. Varsity Tennis for Women. Credit 1.

PHED 1953. Varsity Golf for Women. Credit 1.

PHED 1956. Varsity Golf for Men. Credit 1.

PHED 1963. Varsity Women's Cross Country. Credit 1.

PHED 1966. Varsity Men's Cross Country. Credit 1.

PHED 1970. Varsity Soccer. Credit 1.

PHED 1980. Varsity Women's Track and Field. Credit 1.

PHED 1990. Varsity Cheerleading. Credit 1.

Physical Education, Short Term Courses

PHED 1520. Canoe Camping (fee). Credit 1.

This course provides students with outdoor learning opportunities directly related to canoeing, kayaking and camping. Students will learn in a simulated environment and then go on an outdoor adventure incorporating canoeing and camping. Survival principles will also be studied.

PHED 1530. Backpacking Camping. Credit 1.

This course provides students with outdoor learning opportunities through Backpacking Camping, and survival principles.

PHED 1550. Advanced Open Water Scuba Diving (fee). Credit 1.

This course provides students who already hold a basic scuba certification the opportunity to learn about and participate in advanced open water diving skills. Students will be required to dive in an off campus open water location for the advanced certification.

PHED 1570. Bicycle Touring (fee). Credit 1.

This course is designed as an introduction to the basics of Biking. Students will be introduced to the basic equipment, techniques, terminology, and safety of biking.

Physics (PHYS)

PHYS (MATH) 1020. First-Year Connections.

Rec. 2. Credit 1.

This course is intended as a bridge course for students entering TTU from high school. The course is designed to strengthen the student's connection to TTU, the College of Arts and Sciences, and the appropriate department (CSC, MATH, or PHYS) by focusing on the enhancement of skills needed for academic success.

This course engages the student in meaningful academic and non-academic out-of-the-classroom activities, as learning occurs both in and out of the classroom. It emphasizes critical thinking, the formation of academic and social goals and support groups, and time-management and study skills.

PHYS 1100. Acoustics of Music. Lec. 3. Credit 3.

Prerequisite: Background knowledge of high school Algebra and Geometry. Physical principles of sound as it relates to music, acoustics of musical instruments, auditorium acoustics and sound reinforcement, and sound recording and reproduction. This course will not count as part of a physics sequence.

PHYS 1137. Frontiers of Physics. Rec. 1. Credit 1.

An overview of topics currently at the frontiers of physics.

◆ **PHYS 1310. Concepts of Physics.**

Lec. 2. Lab. 3. Credit 3.

Selected topics from classical and modern physics with applications to familiar phenomena. This course will not count as part of a physics sequence. Credit will not be given for both PHYS 1310 and any of PHYS 2010, PHYS 2020, PHYS 2109, PHYS 2110, PHYS 2111, PHYS 2119, PHYS 2120, PHYS 2121.

PHYS 1901, 1902, 1903, 1904. Special Topics in Physics and Physics Education.

Lec. 0-3. Lab 0-3. Credit 1-4.

Prerequisite: Consent of chair and instructor. (Up to six credits may be earned under this course title.) Topics covered will be chosen on the basis of student interest and need.

◆ **PHYS 2010. Algebra-based Physics I.**

Lec. 3. Lab. 3. Credit 4.

Prerequisite: Background knowledge of high school algebra and geometry. Basic laws of classical

mechanics and waves with elementary applications to familiar phenomena. A student may not earn credit in both PHYS 2010 and any of PHYS 1310, PHYS 2109, PHYS 2110.

◆ **PHYS 2020. Algebra-based Physics II.**

Lec. 3. Lab. 3. Credit 4.

Prerequisite: PHYS 2010. Basic laws of electromagnetism and light with elementary applications and brief introduction to modern physics. A student may not earn credit in both PHYS 2020 and any of PHYS 1310, PHYS 2119, PHYS 2120.

PHYS 2109. Calculus-based Physics I.

Lec. 3. Credit 3.

Prerequisite: MATH 1920 (may be taken concurrently.) Introduction to classical mechanics and mechanical waves. A student may not earn credit in both PHYS 2109 and any of PHYS 1310, PHYS 2010 and PHYS 2110.

◆ **PHYS 2110. Calculus-based Physics I.**

Lec. 3. Lab. 3. Credit 4.

Prerequisite: MATH 1920 (may be taken concurrently.) Introduction to classical mechanics and mechanical waves, with lab. A student may not earn credit in both PHYS 2110 and any of PHYS 1310, PHYS 2010, PHYS 2109, PHYS 2111.

◆ **PHYS 2111. Calculus-based Physics Laboratory I.**

Lab. 3. Credit 1.

Prerequisite: PHYS 2109 (may be taken concurrently.) Experiments in classical mechanics and mechanical waves. A student may not earn credit in both PHYS 2111 and PHYS 2110 (with lab.)

PHYS 2112. General Physics I Honors Recitation.

Rec. 1. Credit 0.

Corequisite: PHYS 2109 or PHYS 2110. Selected topics to add depth to the understanding of material in PHYS 2109/2110. Honors students can receive honors credit for PHYS 2109/2110 by satisfactorily completing this course and obtaining a grade of A or B in PHYS 2109/2110.

PHYS 2119. Calculus-based Physics II.

Lec. 3. Credit 3.

Prerequisite: PHYS 2109 or PHYS 2110, MATH 2110 or MATH 2120 (MATH 2110 or MATH 2120 may be taken concurrently.) Introduction to classical electromagnetism and optics. A student may not earn credit in both PHYS 2119 and any of PHYS 1310, PHYS 2020 and PHYS 2120.

◆ **PHYS 2120. Calculus-based Physics II.**

Lec. 3. Lab. 3. Credit 3.

Prerequisite: Either (i) PHYS 2109 and PHYS 2111 or (ii) PHYS 2110 (with lab); MATH 2110 or MATH 2120 (MATH 2110 or MATH 2120 may be taken concurrently.) Introduction to classical electromagnetism and optics, with lab. A student may not earn credit in both PHYS 2120 and any of PHYS 1310, PHYS 2020, PHYS 2119, PHYS 2121.

◆ **PHYS 2121. Calculus-based Physics Laboratory II.**

Lab. 3. Credit 1.

Prerequisite: PHYS 2110 (with lab) or PHYS 2111, PHYS 2119. (PHYS 2119 may be taken concurrently.) Experiments in classical electromagnetism and optics. A student may not earn credit in both PHYS 2121 and PHYS 2120 (with lab.)

PHYS 2420. Modern Physics.

Lec. 3. Credit 3.

Prerequisite: PHYS 2119 or PHYS 2120. Introduction to modern physics. Topics include special relativity, quantum theory of light, wave nature of matter, Bohr's theory of the atom, quantum mechanics in one dimension. Selected topics from atomic, molecular, solid state, nuclear, and particle physics.

PHYS 2920. Mathematical Physics.

Lec. 3. Credit 3.

Prerequisite: PHYS 2119 or PHYS 2120, MATH 2110. (PHYS 2119 or PHYS 2120 and MATH 2110 may be taken concurrently.) Mathematical methods for classical and modern physics. Selected topics from vector analysis, complex analysis, and vector spaces, with emphasis on applications to physical systems.

PHYS 3120. Statistical Thermal Physics.

Lec. 3. Credit 3.

Prerequisite: PHYS 2420, PHYS 2920, MATH 2120 and CSC 2110. Development of the laws of thermodynamics using statistical mechanics.

PHYS 3610. Classical Mechanics.

Lec. 3. Credit 3.

Prerequisite: PHYS 2920, MATH 2120 and CSC 2100. Theoretical development of classical mechanics, including Newtonian, Lagrangian, and Hamiltonian descriptions.

PHYS 3810. Quantum Mechanics I.

Lec. 3. Credit 3.

Prerequisite: PHYS 2420, PHYS 2920, MATH 4510 (5510) and CSC 2100. (MATH 4510 (5510) may be taken concurrently.) Introduction to principles of quantum mechanics.

PHYS 3820. Quantum Mechanics.

Lec. 3. Credit 3.

Prerequisite: PHYS 3810. Application of quantum mechanics to simple systems.

PHYS 4120. Advanced Modern Physics.

Lec. 3. Credit 3.

Prerequisite: PHYS 3820. Applications of quantum mechanics to selected topics from atomic physics, molecular physics, solid state physics, nuclear and particle physics, and astrophysics.

PHYS 4130. Computational Physics.

Lec. 3. Credit 3.

Prerequisite: PHYS 3810 and CSC 2110. Computational techniques used in physics. Numerical techniques and computational algorithms. Random numbers and Monte Carlo techniques. Errors and uncertainties in computation. Applications of these techniques to classical and modern physics.

PHYS 4610. Classical Electricity and Magnetism I.

Lec. 3. Credit 3.

Prerequisite: PHYS 2119 or PHYS 2120, PHYS 2920, MATH 4510 (5510) and CSC 2110. (MATH 4510 (5510) and CSC 2110 may be taken concurrently.) Theory of electrostatics, electrodynamics, Maxwell's Equations, and boundary value problems.

PHYS 4620. Classical Electricity and Magnetism II.

Lec. 3. Credit 3.

Prerequisite: PHYS 4610 and PHYS 2420. (PHYS 2420 may be taken concurrently.) Applications of Maxwell's Equations to electromagnetic waves and other phenomena. Relativistic electrodynamics.

PHYS 4710. Advanced Experimental Physics.

Lab. 8. Credit 4.

Prerequisite: Consent of instructor. The student will perform selected experiments in classical and modern physics. Emphasis will be placed on computer-based data analysis and development of appropriate oral and written presentation techniques.

PHYS 4711. Advanced Experimental Physics.

Lab. 4. Credit 2.

Prerequisite: Consent of instructor. The student will perform selected experiments in classical and modern physics. Emphasis will be placed on computer-based data analysis and development of appropriate oral and written presentation techniques.

PHYS 4720. Advanced Experimental Physics.

Lab. 8. Credit 4.

Prerequisite: Consent of instructor. The student will perform selected experiments in classical and modern

physics. Emphasis will be placed on computer-based data analysis and development of appropriate oral and written presentation techniques.

PHYS 4730. Research Planning. Lab. 2. Credit 1.

Prerequisite: PHYS 4710 or 4711 (may be taken concurrently). The student will prepare and submit a detailed proposal for a research project to be done in a later semester in the course PHYS 4740 (Research). The project may be a continuation of one started in a previous research internship, in which case documentation from the mentor(s) of the internship must be provided.

PHYS 4740. Research.

Lab. 4. Credit 2.

Prerequisite: PHYS 4730. The student will execute a research project, write a paper about it, and make an oral presentation. The project may be a continuation of one started in a previous research internship, in which case documentation from the mentor(s) of the internship must be provided. All mentors will be involved in determining the final grade.

PHYS 4901. Selected Topics in Physics.

Lec. 1. Credit 1.

Prerequisite: Consent of instructor. Topics covered will be chosen on the basis of student interest and need. Course may be taken for credit more than once as long as the topic is different.

PHYS 4902. Selected Topics in Physics.

Lec. 2. Credit 2.

Prerequisite: Consent of instructor. Topics covered will be chosen on the basis of student interest and need. Course may be taken for credit more than once as long as the topic is different.

PHYS 4903. Selected Topics in Physics.

Lec. 3. Credit 3.

Prerequisite: Consent of instructor. Topics covered will be chosen on the basis of student interest and need. Course may be taken for credit more than once as long as the topic is different.

PHYS 5900. Selected Topics in Physics.

Credit 3, 6, 9.

Topics covered will be chosen on the basis of student interest and need.

◆ **Meets Tennessee Technological University general education requirement (Natural Sciences).**

Political Science (POLS)**◆POLS 1030. American Government.**

Lec. 3. Credit 3.

American systems of constitutional governance; emphasis on the major institutions and policies.

(POLS 1030, TTP Course)**POLS 1100. Introduction to Political Science.**

Lec. 3. Credit 3.

Overview of political science and its subfields: American politics, comparative politics, political behavior, international relations and political theory. Focus on core questions in the discipline as well as the development of writing and critical thinking necessary for upper-division courses in the major.

POLS 2250. Mock Trial.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing or consent of instructor. Introduces the art of persuasion in mock trial cases of civil or criminal law with an emphasis on rules of evidence and courtroom practices. Students will participate in a fall regional invitational competition with the possibility of advancement. May not be repeated for credit.

POLS 3000. Data Analysis

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Computer aided data analysis. Emphasis on statistical analysis of political variables.

POLS 3100. Model United Nations I.

Lec. 2. Lab. 2. Credit 2.

Prerequisite: POLS 1030 or consent of the instructor. Analyze the structure and operations of the United Nations. Includes participation in an annual intercollegiate U.N. simulation. POLS 3100 is one of two courses along with POLS 3101 providing students with a Model U.N. experience. Students may take either or both courses in either order for 2 credit hours each for up to a total of 4 credit hours.

POLS 3101. Model United Nations II.

Lec. 2. Lab. 2. Credit 2.

Prerequisite: POLS 1030 or consent of the instructor. Analyze the structure and operations of the United Nations. Includes participation in an annual intercollegiate U.N. simulation. POLS 3101 is one of two courses along with POLS 3100 providing students with a Model U.N. experience. Students may take either or both courses in either order for 2 credit hours each for up to a total of 4 credit hours.

POLS 3110. Introduction to Legal Reasoning and Analysis.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. This course will provide an introduction to various forms

of legal reasoning including the application of rules (syllogistic reasoning) and of precedents (analogical reasoning), arguing from circumstantial evidence (retroduction, or argument to the best explanation) and from authority (expert and eyewitness testimony), and using formal logic in the analysis of extended legal texts.

POLS 3120. Legal Research and Writing.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. This course is designed to teach students how to research a legal issue, analyze and synthesize appellate opinions, interpret state and federal statutes resulting in the creation of a persuasive legal and memorandum. This course will also expose the students to various legal documents, their purpose, and the proper method of drafting them.

POLS 3130. Moot Court.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Analysis of mock civil or criminal cases with briefing of twenty cases from provided table of authorities as well as submission of team case brief for scoring. Includes participation in an annual statewide Moot Court competition with oral argument. May be repeated once because the topic changes each fall.

POLS 3200. American Political Thought.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Survey of American political theory.

POLS 3300. Introduction to Latin American Politics.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Survey of selected Latin American political systems.

POLS 3310. Politics of Developing Nations.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Focus on the internal politics of selected developing nations.

POLS 3320. U.S. Policy Toward Latin America.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Focus on U.S. foreign policies that have an impact on Latin America and the Caribbean.

POLS 3330. State and Local Government.

Lec. 3. Credit 3.

Comparative study of state executives, legislatures, judiciaries, and policies; overview of counties and municipalities.

POLS 3400. Gender and Politics.

Lec. 3. Credit 3.

Role of gender in American politics and public policy,

emphasizing the influence of political theories on individual world views.

POLS 3500. Political Conspiracy Theories.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of instructor.

Considers the relationship between governments and conspiracy theories, including the political, social and psychological factors that breed conspiracy theories and increase distrust of government institutions.

POLS 3610. International Politics.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Analysis of foreign policy conceptions and factors that affect relations among nations.

POLS 3650. International Organizations.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Analysis of international organizations.

POLS 3670. Foreign Policy.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Development and the formulation of U.S. foreign policy.

POLS 3700. The Legislative Process.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

The origins, organization and functions of legislatures.

POLS 3710. The American Executive.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. A comparative study of governmental executives.

POLS 3810. Judicial Process.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Survey of American state and federal court systems, using qualitative and quantitative methods.

POLS 4100. International Law.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Analysis of the nature, development, and concepts of international law.

POLS 4210. American Political Parties.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Study of political parties, pressure groups, and public opinion.

POLS 4220. Campaigns and Elections.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Considers the practical aspects of campaigning for

public office on all levels of government including strategy, financing, organization, research, and media.

POLS 4230. Scandal and Corruption in U.S. Politics.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of instructor.

This course will introduce students to the phenomenon of political corruption and its effects on American politics. Attention will be paid to contemporary scandal and historical examples, analyzing causes and consequences on both involved politicians and the American public.

POLS 4250. Political Communication.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

An analysis of the relationship between the news media and politics. How do news organizations determine what is newsworthy? How do they report news? Do those reports affect the political opinions of viewers? Do they affect political outcomes? Students will learn theories and debates that have emerged in top political science journals within the past 15 years, ultimately gaining a broad understanding of the effect of mass communication on the political system.

POLS 4310. Constitutional Law I: Struggle for Federal Powers and Accountability.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Recommended POLS 3810. Landmark cases in powers of the judiciary, presidency, Congress, and states' rights, with a Moot Court Term project.

POLS 4320. Constitutional Law II: Civil Liberties and Civil Rights.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of instructor.

Recommended POLS 3810 and POLS 4310. Landmark cases in the development of civil liberties and civil rights of individuals with a Moot Court term project.

POLS 4400. Political Satire.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Study of political satire from the ancients to postmodern influences with an evaluation of the contemporary study of popular culture.

POLS 4410. Political Theory: Ancient and Medieval.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Analysis of political thought from ancient Greece to 1500.

POLS 4420. Political Theory: Early Modern.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor.

Analysis of political thought from 1500 toward the present.

POLS 4430. Power and Privilege on the Screen.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Evaluation of political film, documentaries and campaign ads using appropriate film theories, political texts and political writings.

POLS 4510. Comparative Government: Europe.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. A comparison of the political systems of Europe.

POLS 4520. Comparative Political Behavior.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Examines the individual's decision to participate in political life and the impact those decisions have on policy formation across the world's developed democracies.

POLS 4610. Public Administration and Public Policies.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Theory and cases in public administrative organizations and controls.

POLS 4700. Tennessee Trial Practices.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. The theory and practice of conducting a trial in a Tennessee Court of law including evidence, ethics, procedure, and trial technique. Basic skills in trial advocacy including direct examination, cross examination, voir dire, opening statements, and closing arguments will also be covered.

POLS 4730. First Amendment Law and Analysis.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. An examination of speech, expression, association, the free exercise of religion, and the relationship between church and state as those concepts are understood in the context of the First Amendment and constitutional law. Also included is the impact of new and emerging technology as it relates to these concepts.

POLS 4900. Independent Study.

Credit 3.

Prerequisite: Consent of the instructor. Supervised research and reading in any area where there is no appropriate course offering. May be taken twice, provided the topic is different.

POLS 4901. Independent Study.

Lec. 1. Credit 1.

Prerequisite: Consent of instructor. Supervised research

and reading in any area where there is no appropriate course offering. May be taken twice, provided the topic is different.

POLS 4910. Seminar in Public Law.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Advanced readings in human rights issues.

POLS 4911-4919. Special Projects.

Credit 3.

Prerequisite: POLS 1030 or consent of instructor. Seminar or lecture course on a selected topic, issue, or interest areas in political science.

POLS 4920. Seminar in Comparative Politics.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Advanced reading and research on selected topics in comparative politics.

POLS 4950. Political Participation Internship.

Credit 3-12.

Prerequisite: POLS 1030 and POLS 3330. Directed study and research while serving as an intern in a political party. (Note: No more than six hours may be counted as "approved courses" in major.)

POLS 4960. Seminar in World Politics.

Lec. 3. Credit 3.

Prerequisite: POLS 1030 or consent of the instructor. Advanced reading and research on selected areas in international politics.

POLS 4990. Internship.

Credit 1-12.

Prerequisite: POLS 1030 or consent of the instructor. Directed study and research while serving as an intern in appropriate governmental offices. (Note: Only six hours may be counted as "approved courses" in the major.)

◆ Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).

Popular Culture (POPC)

POPC 4010 (5010). Topics.

Lec. 1-3. Credit 1-3.

Special topics in popular culture.

POPC 4050 (5050). Science Fiction and Fantasy.

Lec. 3. Credit 3.

Analysis and discussion of themes, conventions, and stereotypes in short stories, novels, and films.

POPC 4060 (5060). Detective Fiction.

Lec. 3. Credit 3.

Private detectives, policemen, and spies in fiction.

Professional Communication (PC)

◆ PC 2500. Communicating in the Professions.

Lec. 3. Credit 3.

Prerequisite: ENGL 1020 or concurrent enrollment in ENGL 1020. Overview of skills and principles related to oral communications in various professions.

PC (ENGL) 3250. Professional Communication I.

Lec. 3. Credit 3.

Prerequisite: ENGL 1020. The preparation of effective technical and professional reports; the preparation and delivery of effective oral reports.

PC (WEBD) 3500. Rhetoric and the Internet.

Lec. 3. Credit 3.

Prerequisite: ENGL 1020. Instruction in web site analysis and document design, including background in rhetorical theory and principles.

PC (WEBD) 3700. Information Design in the Professions.

Lec. 3. Credit 3.

Prerequisite: ENGL 3250 or PC 3250. Practical experience in the field of information design: a specialized field in which complex information is presented clearly and efficiently to its intended audience. Students will study the design principles used to develop both print and web documents and learn about the technologies used to develop and publish such documents.

PC 3750. Ethics in the Professions.

Lec. 3. Credit 3.

Prerequisite: ENGL 1010 and ENGL 1020. Overview of multidisciplinary ethical issues that affect all disciplines, including privacy, social responsibility, informed consent, morality, responsibility, and professional codes of ethics. The course focuses on case studies of ways these issues apply in various professions.

PC 4850 (5850). Internship.

Credit 3, 6, 9.

Prerequisite: PC 4940 (5940) or 4970 (5970). Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals. Includes a reflective component in the form of a paper or journal that connects the student's work with research covered in pre-requisite courses. Course may be repeated for up to a total of nine credit hours. Undergraduate students may not take more than nine credit hours of PC 4850 during their degree programs. Graduate students may take no more than six credit hours of PC 5850 during their degree programs.

PC (JOUR) 4940 (5940). Technical Editing.-Spring.

Lec. 3. Credit 3.

Prerequisite: PC (ENGL) 3250. Principles and practices of technical editing.

PC (ENGL) 4970 (5970). Professional Communication II.-Fall.

Lec. 3. Credit 3.

Prerequisite: ENGL 3250 or PC 3250. A continuation of PC 3250 with emphasis on more complex reports.

PC 4990. Business and Grant Proposal Writing.

Lec. 3. Credit 3.

Prerequisite: ENGL 3250 or PC 3250. Theory and practical experience developing business and grant proposals.

◆ Meets Tennessee Technological University general education requirement (Communication/Oral Presentation).

Professional Studies (PRST)

PRST (LIST) 4995. Capstone Project.

Lec. 3. Credit 3.

Prerequisite: Permission of instructor. Academic research or other creative activity resulting in a tangible product to demonstrate synthesis of student's coursework. This course is required for all PRST and LIST majors.

Psychology (PSY)

◆ PSY 1030. Introduction to Psychology.

Lec. 3. Credit 3.

Introduction to methods and findings of contemporary psychology. Emphasis on psychological basis for understanding human behavior. Consideration of maturation, learning, thinking, motivation, emotion, sensation, perception, and personality.

(PSYC 1030, TTP Course)

PSY 2110. Psychology of Adjustment.

Lec. 3. Credit 3.

Behavior and adjustment in modern society, maturing self- concept, adjustment to psychological stress, and prevention of maladjustment.

(PSYC 2110, TTP Course)

PSY 2130. Life Span Developmental Psychology.

Lec. 3. Credit 3.

Developmental aspects of psychological functioning from the prenatal period to adulthood with emphasis on individual differences.

PSY 3000. Problem Solving. Lec. 3. Credit 3.
Introduction to concepts and methods used in problem-solving.

PSY 3010. Statistics and Experimental Design. Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 1030, 3 additional PSY credit hours; and MATH 1530 or MATH 1130. Fundamental statistics for the behavioral sciences, descriptive uses, probability, one-way, factorial designs, repeated measures and split-plot designs, bivariate correlation and regression, and non-parametrics.

PSY 3020. Information Literacy in Psychology. Lec. 3. Credit 3.
Prerequisite: PSY 1030, 3 additional PSY credits. The course emphasize information literacy in reading, evaluating, and summarizing scientific literature in Psychology. The course includes exposure to scientific writing (APA format) and basic research concepts and terminology in Psychology.

PSY 3030. Careers in Psychology. Lec. 3. Credit 3.
The course explores the various career paths that can be taken with a degree in psychology, which may include clinical/counseling, cognitive neuroscience, industrial/organizational, healthcare informatics, educational research, and other career applications.

PSY 3040. Positive Psychology: The Science of Well-being. Lec. 3. Credit 3.
Prerequisite: Junior standing required. The purpose of this course is to examine the fundamentals of positive psychology. Example topics discussed: Happiness, Courage, Optimism, Empathy.

PSY 3110. Experimental Psychology. Lec. 3. Lab. 2. Credit 4.
Prerequisite: Minimum grade of C in PSY 3010. Methods and techniques of research in general experimental psychology. Emphasis on design, data collection, analysis, and report writing.

PSY 3140. Experimental Social Psychology. Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 3110. Experimental testing of theories and models, experimental social designs and problems, and assigned and original laboratory projects.

PSY 3150. Cognitive Psychology. Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 1030. Experimental methods used in the study of memory, thinking and cognition.

PSY 3160. Applied Research Methods. Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 3010. Examination of methods used to research psychological questions of an applied nature in specialties such as industrial, health, consumer, and community psychology. Topics include survey, evaluation, and quasi-experimental research methods.

PSY 3300. Introduction to Social Psychology. Lec. 3. Credit 3.
Prerequisite: PSY 1030. Introduction to methods in social psychology and processes of social influence.

PSY 3400. Industrial Psychology. Lec. 3. Credit 3.
Introduction to the areas of employee selection, training, performance appraisal, theories, work motivation, and development.

PSY 3410. Group Dynamics. Lec. 3. Credit 3.
Group development, the individual in group processes, interaction, leadership, and decision-making.

PSY 4050 (5050). Learning and Cognition. Lec. 3. Credit 3.
Prerequisite: PSY 1030. Theory, research and applications in human learning, memory and cognitive processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4100 (5100). Child Psychology. Lec. 3. Credit 3.
Prerequisite: PSY 1030 and PSY 2130. Hereditary and environmental influence on physical and psychological growth. Cognitive, affective and language development of infant and child with an emphasis on disorders and problems in development. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4130 (5130). Brain and Behavior. Lec. 3. Credit 3.
Prerequisite: PSY 2010 and 3 additional PSY credits. Biological approach to understanding behavior. Students will focus on the anatomy and physiology of the nervous system in reference to behavior, perception, mental disorders, and drug action. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4140 (5140). Health Psychology. Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 3110. Biopsychosocial approach to examining how stress, personality and lifestyle are related to physical health. Students will experientially explore a variety of coping strategies and relaxation

techniques geared toward self-assessment and understanding. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4150 (5150). Psychology of Personality.

Lec. 3. Credit 3.

Prerequisite: PSY 1030. Application of psychological principles to an understanding of personality, development, and interpersonal adjustments. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4160 (5160). Abnormal Psychology.

Lec. 3. Credit 3.

Prerequisite: PSY 1030 and 3 additional PSY credits. Nature of abnormal behavior, etiology, symptomatology and treatment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4200 (5200). Adolescent Psychology.

Lec. 3. Credit 3.

Prerequisite: PSY 1030. Origin and principles of behavior with emphasis on educational problems in guiding growth and development in adolescents. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4250 (5250). Introduction to Psychological Testing.

Lec. 3. Credit 3.

Prerequisite: PSY 1030. Basic concepts in psychological testing, interpreting test scores, and types of standardized tests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4300 (5300). Adult Psychology.

Lec. 3. Credit 3.

Prerequisite: PSY 1030. Physical, cognitive, and psychological development in young adulthood, middle age, and old age. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4320 (5320). Introduction to Therapeutic Techniques.

Lec. 3. Credit 3.

Prerequisite: PSY 4150 (5150) and PSY 4160 (5160). An introduction to various therapeutic techniques including analytic, nondirective, in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4400 (5400). Psychopharmacology.

Lec. 3. Credit 3.

Prerequisite: PSY 1030. An introduction to the

psychological and physiological impact of drugs. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4600 (5600). Microcomputers in Psychological Research.

Lec. 1. Lab. 4. Credit 3.

Prerequisite: PSY 1030. Introduction to the use of computers in psychological research. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4800 (5800). History of Psychology.

Lec. 3. Credit 3.

Prerequisite: PSY 1030. Theoretical systems, experiments and prominent figures in the development of modern psychology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY (NURS, SOC) 4810 (5810). Concepts of Gerontology.

Lec. 3. Credit 3.

Prerequisite: PSY 2130 or PSY 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adult.

PSY 4903 (5903). Special Topics.

Credit 3.

Prerequisite: Junior standing. Concentration on a special topic in psychology. Course may be repeated if topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4913 (5913). Special Topics.

Credit 3.

Prerequisite: Junior standing. Concentration on a special topic in psychology. Course may be repeated if topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4921 (5920). Special Topics.

Credit 1, 2, 3.

Concentration on a special topic in psychology. Course may be repeated if topic is different. Junior standing required. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4922. Special Topics.

Credit 1, 2, 3.

Concentration on a special topic in psychology. Course may be repeated if topic is different. Junior standing required. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4923. Special Topics.

Credit 1, 2, 3.

Concentration on a special topic in psychology. Course may be repeated if topic is different. Junior standing

required. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4930. Senior Thesis. Sem. 3. Credit 3.
Prerequisite: Minimum grade of C in PSY 3110.
Capstone experience that requires students to conduct an original research project which ties together previously learned statistical methods, research skills, and oral/written communication skills. Students complete all work through the presentation of the research proposal.

PSY 4931. Senior Thesis. Sem. 3. Credit 3.
Prerequisite: PSY 4930. Capstone experience that requires students to conduct an original research project which ties together previously learned statistical methods, research skills, and oral/written communication skills. Students complete the data collection, statistical analyses, and final manuscript.

PSY 4940. Field Experience in Psychology. Credit 1-3.
Prerequisite: Junior standing required. Supervised application of Psychology in educational, therapeutic, or commercial institutions. May be repeated up to 6 credit hours as long as each practicum assignment is substantially different.

◆ **Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).**

Reading (READ)

READ 1010. College Reading Improvement. Lec. 2. Lab. 2. Credit 3.
Placement by ACT Reading score less than 19 [and/or by COMPASS Placement Exam scores less than 83], by advisor recommendation, or by student self-placement. Improvement of reading skills, including vocabulary, spelling comprehension, rate, main idea, supporting details, organization and relationships, and critical and strategic reading.

Students with a Reading requirement may be restricted in the number or type of high-reading-content classes they may take until they have removed the learning support requirement. Withdrawal is not allowed except with special permission.

Students who self-place/volunteer for READ 1010 are not under such restrictions.

READ 1100. Learning Support Lab for English Composition I and Reading. Lab. 1. Credit 0.
Placement by ACT English score less than 18 and/or by COMPASS Placement Exam Writing score less than 77 or placement by ACT Reading score less than 17 and/or by COMPASS Placement Exam Reading score less than 73.

Learning Support Lab for Writing and Reading is provided through tutoring, workshops, conferences, computer software, etc., [both in and out of the classroom setting] by Learning Support Program faculty and supervised teaching assistants. Topics covered are intended to coincide with the schedules/syllabi for ENGL 1010 and READ 1010 to support concepts as they are introduced in those classes. Withdrawal is not allowed except with special permission.

READ 3311. Literacy I. Lec. 7. Credit 7.
Prerequisite: Full admission to the Teacher Education Program. This course is an integration of concepts fundamental to the development of literacy from birth through middle grades. It includes a study of children's literature, language development and communication skills, language arts, and the assessment and selection of appropriate instructional strategies based upon student need.

READ 3312. Literacy II. Middle School Reading Program. Lec. 7. Credit 7.
Prerequisite: Full admission to the Teacher Education Program. This course is an integration of concepts fundamental to the development of literacy from birth through middle grades. It includes a study of language development and communication skills, language arts, content area reading, and the assessment and selection of appropriate instructional strategies based upon student need.

READ 3313. Literacy for Special Populations. Lec. 5. Credit 5.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: FOED 3810. This course is an integration of the five main components of reading plus writing which are fundamental to the development of literacy from birth through middle grades. It includes a study of language development and communication skills, language arts, content area reading, and the assessment and selection of appropriate instructional strategies based upon student need.

READ 3350. Teaching Reading in the Content Areas. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Emphasis on skills needed for content area

reading and selection of materials and appropriate techniques for diverse learners.

READ (LSCI) 4020 (5020). Storytelling and Traditional Literature. Lec. 3. Credit 3.
Storytelling techniques and literature presentation through storytelling.

READ 4411 (5411). The Reading-Writing Connection: Secondary. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: READ 3350. Explores the connection between the reading and writing process as a means of mutual improvement.

READ (LSCI) 4540 (5540). Multiethnic Literature for Infants, Toddlers and Preschoolers. Lec. 1. Credit 1.
Introduction to preschool trade books and related materials reflecting an understanding of multiethnicity.

READ (LSCI) 4550 (5550). Multiethnic Literature for Children. Lec. 1. Credit 1.
Introduction to children's trade books and related materials reflecting an understanding of multiethnicity.

READ (LSCI) 4560 (5560). Multiethnic Literature for Adolescents and Adults. Lec. 1. Credit 1.
Introduction to adolescent and adult trade books and related materials reflecting an understanding of multiethnicity.

READ (LSCI) 4570 (5570). Young Adult Literature. Lec. 3. Credit 3.
Survey of books and materials for middle level, high school students, and adults focusing on techniques to assist in reading these materials with understanding.

Religious Studies (RELS)

◆**RELS 2010. Introduction to Religious Studies.** Lec. 3. Credit 3.
Introduction to the academic study of religion and the field of Religious Studies. Students will explore basic questions related to religion in a cultural, historical and personal context. In addition, the course will offer an overview of five major world religions: Buddhism, Christianity, Hinduism, Islam, and Judaism.

RELS 3300. Martin Luther King Jr.: Rhetoric & Theology of Non-Violent Social Change. Lec. 3. Credit 3.
This course will take an interdisciplinary approach to explore the lasting legacy of Martin Luther King Jr. Special emphasis will be given to the role of religion in the Non-Violent Social Change movement, and to the

philosophical and theological training that influenced Dr. King's thinking.

RELS 4041, 4042, 4043. Directed Study. Indep. St. 1, 2, 3. Credit 1, 2, 3.
Individualized directed study with a faculty mentor. Students may take up to 6 hours of Directed Study with different topics.

RELS 4093. Special Topics. Lec. 3. Credit 3.
Upper Division level study in a specific religious studies topic not commonly found in a discipline on campus. May be repeated if topic is different. No more than 9 hours of RELS 4093 may be used for degree.

RELS 4110. Jesus in History, Faith, and Tradition. Lec. 3. Credit 3.
Prerequisite: RELS 2010, or permission of the instructor. The goal of the course is to explore the life, teachings, and influence of Jesus of Nazareth. Special emphasis will be given to various sources of information regarding his life and teachings.

RELS 4300. New Religious Movements. Lec. 3. Credit 3.
Prerequisite: RELS 2010 or permission of instructor. The purpose of this course is to introduce students to the historical and cultural contexts of New Religious Movements (commonly known as cults or sects) primarily in the United States, from the Second Great Awakening forward. The course will develop students' understanding of Religious Studies as a discipline, and encourage individual inquiry into Religious Studies topics.

◆ **Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).**

Secondary Education (SEED)

SEED 4120 (5120). Materials and Methods of Teaching English. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program; READ 4411 (5411); and COMM 2025 or PC 2500. Corequisite: FOED 3820. Prerequisite or Corequisite: Any two of the following: ENGL 3810, ENGL 3820, ENGL 3910, or ENGL 3920; and READ 3350. Principles, objectives, techniques, and evaluation in secondary school teaching of English.

SEED 4121 (5121). Materials and Methods of Teaching Career Technical Education. Lec. 3. Credit 3.
Principles, objectives, techniques, and evaluation in secondary school teaching of career technical education.

SEED 4122 (5122). Materials and Methods of Teaching Mathematics.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of Mathematics.

SEED 4123 (5123). Materials and Methods of Teaching the Sciences.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of the sciences.

SEED 4124 (5124). Materials and Methods of Teaching Social Studies.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of Social Studies.

SEED 4125 (5125). Materials and Methods of Teaching Foreign Language.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: FOED 3800 or CUED 6800. Principles, objectives, techniques, and evaluation in secondary school teaching of foreign languages. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SEED 4322 (5322). Teaching Algebra in Middle/High School.

Lec. 3. Credit 3.

Topics in Algebra, philosophy, new trends, and methods of teaching algebra in Grades 5-12.

SEED 4422 (5422). Teaching Secondary Mathematics Using Technology.

Lec. 3. Credit 3.

Exploring technologies specific to Mathematics teaching and appropriate applications of these technologies in the classroom.

SEED 4870. Student Teaching I.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SEED 4880 and SEED 4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and classroom management. A grade of B is required to meet degree requirements.

SEED 4871. Residency I.

Credit 5.

Prerequisite: FOED 3820 grade B or better, full admission to the Teacher Education Program, and full admission to Residency I. Corequisite: SEED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning

environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

SEED 4872. Professional Seminar I.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SEED 4871. Seminar for Residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

SEED 4880. Student Teaching II.

Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite SEED 4870 and SEED 4890. Continuation of SEED 4870 in a different setting. A grade of B is required to meet degree requirements.

SEED 4881. Residency II.

Credit 10.

Prerequisite: SEED 4871 with a grade of B, full admission to the Teacher Education Program. Corequisite: SEED 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

SEED 4882. Professional Seminar II.

Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SEED 4881. Seminar for Residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

SEED 4890. Seminar: Education and Society.

Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SEED 4870 and SEED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Sociology (SOC)**◆SOC 1010. Introduction to Sociology.**

Lec. 3. Credit 3.

Fundamental concepts and basic principles underlying human social relations.

(SOCI 1010, TTP Course)

SOC 1020. An Orientation to Sociology.

Lec. 2. Credit 1.

A course required for all Sociology majors, designed to assist the student in acquiring basic knowledge and skills necessary to be a successful sociology major. Additional focus upon personal and academic adjustments to college in general. May be taken at the same time as SOC 1010. Must be taken at first opportunity after declaration of sociology as a major.

SOC 1650. Social Problems.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Contemporary social problems.

(SOCI 1020, TTP Course)**SOC (ANTH) 2100. Cultural Ecology.**

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Interaction between human cultural systems and the physical environment in prehistoric through modern times.

SOC 2110. Social Class and Inequality in America.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Current and comprehensive description of the social class structure, socioeconomic inequality, and related politics of American society.

SOC 2630. Marriage and Family Relations.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A sociological approach to marriage and family living, dating, male-female roles, mate selection, marital adjustment, parenthood, widowhood, divorce, and remarriage.

(SOCI 2010, TTP Course)**SOC (CJ) 2660. Criminology.**

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing. Crime, the criminal, and society's responses to the behavior.

SOC 2840. The Aged in American Society.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Analysis of social, psychological, and economic problems in aging.

SOC 3100. Sociological Theory.

Lec. 3. Credit 3.

Prerequisite: SOC 1010. Survey of the development of major schools of thought in modern sociology with instruction and evaluation in oral presentations.

SOC 3150. Social Psychology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. This course will examine how individuals shape and are shaped by their social situations. There

will be a particular emphasis on the symbolic interaction perspective with the goal of helping students better understand their identities and social interactions.

SOC 3200. Sociology of Sex and Gender.

Lec. 3. Credit 3.

Prerequisite: SOC 1010. A sociological perspective on the development and operation of gender with emphasis on social structure and culture.

SOC 3300. Occupational Sociology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. The social dimensions of occupations (both legitimate and deviant) with an emphasis on the troubles and tensions workers encounter.

SOC 3550. Applied Sociology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Applications of sociological knowledge and its relation to the context of interaction between sociologists and policy-makers.

SOC 3600. Environmental Sociology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Explores the relationship between society and the physical environment with emphasis on environmental usage patterns, environmental justice issues, and the causes and consequences of environmental pollution and over-population problems, with an orientation toward possible solutions of these problems.

SOC (CJ) 3620. Victimology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660. Students must be majoring on SOC, SOC/CJ/, or SOC/SW. Non majors may be admitted by consent of instructor. This course provides an in-depth analysis of the victims of criminal activity including: the various challenges victims face as they seek justice through the criminal justice system; the risk factors and probability of experiencing crime; and, specific theoretical perspectives that center on the victims of crime. Topics such as restorative justice and victim blaming are also explored.

SOC (CJ) 3640. Cybercrime.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or consent of the instructor. This course provides a broad introduction into the world of cybercrime. Cybercrime includes various forms of criminal activity and is broadly defined as the destruction, theft, or unauthorized or illegal use, modification, or copying of information, programs, services, equipment, or communication networks.

SOC (CJ) 3650. Juvenile Delinquency.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010. The study of the causes of juvenile misconduct, possible responses to the problem, and the system of juvenile justice.

SOC 3710. Urban Sociology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. History of urbanization. Analysis of contemporary urban society and its social problems.

SOC 3720. Rural Sociology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Development of rural society, its relationship to urban society, and contemporary rural social problems.

SOC 3730. Technology and Society.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Relationships of different types of technologies to different types of social and cultural systems.

SOC (SW) 3900. Introduction to Social Research.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 and three hours of Sociology or consent of instructor. Methods of sociological research including considerations of research design, strategies, techniques and procedures.

SOC 3910. Social Science Statistical Analysis.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or SW 1800. Introduction to basic statistics and their uses in the social sciences.

SOC (CJ) 3911. Introduction to Crime Analysis.

Lec. 3. Credit 3.

Prerequisite SOC 1010; SOC (CJ) 2660. Students must be majoring in SOC, SOC/CJ, or SOC/SW. Non majors may be admitted by consent of instructor. This course provides students with instruction in the use of Microsoft Excel with applications for crime analysis.

SOC 3920. Sociological Applications Using SPSS.

Lec. 3. Credit 3.

Prerequisite: SOC 3910. This course deals with applications of the Statistical Package for the Social Sciences (SPSS), including: direct data input, data importation from other sources (i.e. national data base and Excel spreadsheets), and using SPSS to perform and interpret a wide variety of commonly used statistical applications in Sociology ranging from descriptive statistics to multivariate analysis.

SOC (CJ) 4010 (5010). Organized Crime.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660. Organized crime in America as a product of legal, historical, cultural, and economic forces.

SOC (ANTH, CJ) 4040 (5040). Law and Culture.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A comparative cross-cultural analysis of primitive, traditional, and modern attitudes toward law, social control, punishment, and individual responsibility.

SOC (CJ) 4050. Crime and Media.

Lec. 3 Credit 3.

Prerequisite SOC 1010 or SOC/CJ 2660 or consent of the instructor. An analysis of crimes, criminals, and punishment as they appear in American popular culture and various media.

SOC 4080 (5080). Sociology of Appalachia.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. An exploration of the people, culture, and political economy of Appalachia.

SOC 4090 (5090). Cross Cultural Communications and Cultural Diversity.

Lec. 3. Credit 3.

An examination of the socio-cultural context of communication with emphasis upon enhancing communication skills across cultures.

SOC 4120 (5120). Sociology of Death and Dying.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. The social and cultural dimensions of death and dying in American society with emphasis on the meaning of death, the death industry, the social context of death and dying, and bereavement.

SOC 4210 (5210). Race, Ethnicity and Multiculturalism.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Ethnic and cultural variations in the U.S. and similar mass societies. Emphasis on economic, political, and social relationships between ethnic groups.

SOC 4220 (5220). Sociology of Mass Communications.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Historical and organizational analysis of various mass media and their content. Social issues and the mass media.

SOC 4320 (5320). Sociology of Religion.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Cross-cultural analysis of religion as a social factor at the societal, organizational, and personality systems levels.

SOC 4330 (5330). Population and Social Process.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Sociological analysis of the interrelationship between particular population characteristics and patterns of social organization.

SOC 4430 (5430). People in Organizations.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Analysis of the structures and processes of large bureaucratic organizations with emphasis on individuals' relationships to them.

SOC 4500 (5500). Sociology of Alcohol Abuse and Alcoholism.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Sociological analysis of alcohol abuse and alcoholism, issues in prevention and rehabilitation, and implications for education.

SOC 4510 (5510). Social Deviance.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Examination of various groups who are identified as deviant due to their unacceptable behavior and relative powerlessness.

SOC 4515 Sexual Offenses and Offenders.

Lec. 3. Credit 3.

Prerequisite: SOC 1010. This course provides a broad introduction into the world of sexual offenses. Accordingly, this course will provide information on survivors of these crimes, perpetrators, as well as relevant sociological factors. An emphasis will be placed on understanding the perpetrator specifically.

SOC (CJ) 4520. Domestic Violence.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or consent of instructor. This course investigates all forms of domestic violence from a sociological perspective including theoretical explanations, prevalence, risk factors, dynamics of prevention, and intervention.

SOC (CJ) 4530. Sociology of Murder.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or CJ 2660 or consent of the instructor. This course provides an analytical study of murder and violence in the United States. As such,

course topics include: different types of homicide, offender characteristics, etiological considerations of becoming an offender or victim, the role of social profiling in the investigation of various types of murder, theoretical approaches to the study of murder, and patterns and sources of violence. Taking into account the grisly topic, students that are distributed by particularly heinous crimes should avoid enrolling into this course.

SOC 4610 (5610). Contemporary American Family.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Models of family organization, variations in the institutional pattern, kinship, and basic social trends affecting the family.

SOC (CJ) 4660 (5660). Corrections.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Correctional services, practices, and issues with particular attention to the maximum security adult institution.

SOC 4810. Concepts of Gerontology.

Cross-listing: NURS 4810, PSY 4810 (5810).

Lec. 3. Credit 3.

Prerequisite: PSY 2130 or PSY 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adult.

SOC 4830 (5830). Medical Sociology.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Examination of the significance of the complex relationship between attitudes, beliefs relating to the underlying causes of disease, the level of health characteristics, appropriate treatment practices, and the role of the healer in various groups and societies.

SOC 4860 (5860). Social Movements and Social Change.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Analysis of social movements and other kinds of planned and unplanned change in society.

SOC (CJ, SW) 4900, 4901 (5900). Internship.

Credit 3.

Prerequisite: Nine hours of Sociology. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. (Students may take a maximum of two internships for up to a total of 6 hours of Internship. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements with any additional hours counting as upper division general elective hours.)

SOC 4911. Geographic Information Applications in the Social Sciences.

Lec. 3. Credit 3.

Prerequisite: SOC 1010. This course provides a broad introduction into the world of geographic information systems (GIS) and their applicability to the social sciences – particularly criminal justice. Students are required to complete a major research project using GIS applications and to present the results.

SOC (CJ, SW) 4915 (5915). Internship.

Credit 6.

Prerequisite: Nine hours of Sociology. Six hour internships are only available for internships that offer special opportunities that are not available in a 3 hour internship. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 6 hours of credit.

SOC 4920 (5920). Data Analysis and Management.

Lec. 3. Credit 3.

Prerequisite: SOC 3900 and SOC 3910. The techniques of management and analysis of quantitative social science data from primary and secondary sources.

SOC (CJ, SW) 4925 (5925). Internship.

Credit 9.

Prerequisite: Nine hours of sociology. Nine hour internships are only available for internships that offer special opportunities that are not available in a 3 or 6 hour internship. The great majority of these will be summer internships that require the intern to work a 40 hour week. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 9 hours of credit.

SOC 4930 (5930). Field Research Methods.

Lec. 3. Credit 3.

Prerequisite: SOC 3900 or consent of instructor. An in-depth examination and direct involvement with various qualitative research tools and techniques used by sociologists.

SOC (CJ, SW) 4940. Independent Study.

Credit 1.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4941. Independent Study.

Credit 1.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4948. Independent Study.

Credit 2.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4949. Independent Study.

Credit 2.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4950 (5950). Independent Study.

Credit 3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4951. Independent Study.

Credit 3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC 4970 (5970). Special Topics.

Cross-listing: CJ 4970 (5970), SW 4970. Credit 1.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4971-4979. Special Topics.

Credit 1.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC 4980 (5980). Special Topics.

Cross-listing: CJ 4980 (5980), SW 4980. Credit 2.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4981-4989. Special Topics.

Credit 2.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC 4990 (5990). Special Topics.

Cross-listing: CJ 4990, SW 4990. Credit 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ, SW) 4991-4998. Special Topics.

Cross-listing: CJ 4991, SW 4991. Credit 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC 4999. Senior Seminar. Lec. 3. Credit 3.

Prerequisite: SOC 3100, SOC 3910, SOC 4920 (5920), SOC 4930 (5930) or by permission of instructor.
Capstone course designed to be taken by sociology majors in the senior year. Course reviews major areas in the field of sociology in preparation for the Major Field Exam and in preparation for professional life.

◆ **Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).**

Social Work (SW)**SW 1800. Introduction to Social Work.**

Lec. 3. Credit 3.

An introduction to the organization and structure of professional social services including major interventive methods.

(SWRK 2010, TTP Course)

SW (SOC) 3900. Introduction to Social Research.

Lec. 3. Credit 3.

Prerequisite: SOC 1010 and three hours of Sociology or consent of instructor. Methods of sociological research, including considerations of research design, strategies, techniques, and procedures.

SW (CJ) 4100 (5100). Probation and Parole.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Probation and parole services with special attention to current practices and issues.

SW (CJ) 4120 (5120). Case Management.

Lec. 3. Credit 3.

Prerequisite: Sophomore Standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Individual and group methods used in counseling and treating offenders in both the institutional and community setting.

SW (CJ, SOC) 4900 (5900). Internship. Credit 3.

Prerequisite: Nine hours of Sociology. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. (May be taken once for Upper Division credit to fulfill major or minor requirements and a second time as a general elective.)

SW 4915. Internship.

Credit 6.

Prerequisite: Nine hours of Sociology. Six hour internships are only available for internships that offer special opportunities that are not available in a 3 hour internship. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 6 hours of credit.

SW (CJ, SOC) 4925. Internship.

Credit 9.

Prerequisite: Nine hours of Sociology. Nine hour internships are only available for internships that offer special opportunities that are not available in a 3 or 6 hour internship. The great majority of these will be summer internships that require the intern to work a 40 hour week. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 9 hours of credit.

SW (CJ, SOC) 4940. Independent Study. Credit 1.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4941. Independent Study. Credit 1.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of Sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4948. Independent Study. Credit 2.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of Sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4949. Independent Study. Credit 2.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of Sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW 4950 (5950). Independent Study.
Cross-listing: CJ 4950, SOC 4950 (5950). Credit 3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of Sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4951. Independent Study. Credit 3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of Sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW 4970. Special Topics.
Cross-listing: CJ 4970 (5970), SOC 4970 (5970). Credit 1.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in Sociology. Students may take a total of up to 6 hours of special topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4971-4979. Special Topics. Credit 1.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in Sociology. Students may take a total of up to 6 hours of special topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4980. Special Topics. Credit 2.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in Sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

SW (CJ, SOC) 4990. Special Topics. Credit 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in Sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for Upper Division credit to fulfill major or minor requirements.

Special Education (SPED)

(O) and (E) Denote Odd and Even Years Respectively

SPED 2010. Introduction to Special Education. Lec. 3. Credit 3.

This course is designed to provide candidates with: (a) an understanding of historical and contemporary perspectives on the critical issues of students with exceptional needs and the state of federal laws influencing the education of exceptional students, (b) an understanding of the characteristics and needs of children placed in the most prevalent disability categories, and (c) to provide candidates with an overview of special education service delivery models, methods and procedures as indicated by research and practical applications.

SPED 2040. Special Education Procedures and Methods. Lec. 3. Credit 3.
Prerequisite: SPED 2010 or consent of instructor.
Overview of best practices in the delivery of special education and support services.

SPED 2821. Practicum: Special Education Procedures and Methods. Lab. 4. Credit 1.
Prerequisite: SPED 2010 or consent of instructor.
Corequisite: SPED 2040. Supervised observation, recording, and practice of methods and procedures used in special education.

SPED 3000. Teaching Persons with Disabilities in the Regular Classroom. Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Alternatives in educational assessment, materials, methods, and procedures for the regular classroom teacher.

SPED 3020. Characteristics and Needs of Persons with Comprehensive Disabilities. Lec. 3. Credit 3.

Prerequisite: SPED 2010, SPED 3050 and full admission to the Teacher Education Program. This course is designed to provide an intensive study into the various types of disabilities that fall within the range of moderate to severe disabilities. In addition to the characteristics of these disabilities, students will explore a broad range of research based teaching strategies and techniques for this population. A built in practicum will provide hands-on experience while implementing systematic data driven instruction. Additional emphasis is placed on core components that serve students who receive special education services with moderate to severe disabilities.

SPED 3030. The Education of Persons with Learning Disabilities. Lec. 3. Credit 3.

Prerequisite: SPED 2010, SPED 3050 and full admission to the Teacher Education Program. This course will provide an intensive study of background information and current perspectives in specific learning disabilities. Concepts of neurological dysfunction, dyslexia, perceptual impairments, etc., are reviewed from an interdisciplinary perspective. Emphasis on knowledge, comprehension, and evaluation of these concepts as they apply to education and behavior management strategies. Considerations in diagnosis and educational programming are developed.

SPED 3031. Physical Management and Support Services for Orthopedic, Motor and Health Impaired.

Lec. 3. Lab. 2. Credit 3.

Introduction to medical and educational support services. Emphasizes handling, instructional modifications, and support services.

SPED 3050. Universal Design for Special Education.

Lec. 5. Credit 5.

Prerequisite: SPED 2010 and full admission to the Teacher Education Program. This course is designed to provide candidates with an extensive overview of research based strategies for improving student outcomes through universally designed planning of environment, instruction, and assessment. The course will also focus on service delivery models, methods, and procedures for including the use of state and federal mandates.

SPED 3110. Behavior Concepts. Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Focus on defining applied behavior analysis; selecting, assessing and evaluating behavior to change; and functional and experimental analyses of behavior change.

SPED 3120. Interventions and Supports.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program and SPED 3110. Focus on the development of new behaviors, various clinical interventions for decreasing interfering behaviors, and maintaining behavioral changes.

SPED (AGHT) 3480. Horticultural Therapy.-Spring (O). Lec. 2. Lab. 2. Credit 3.

Introduction to the application of horticulture for special education and as therapy for treatment, rehabilitation, and/or training of individuals with disabilities.

SPED (COMM) 4000 (5000). Introduction to Communication Disorders. Lec. 3. Credit 3.

Principles of and therapeutic approaches to speech, language, and hearing disorders.

SPED 4030. Applied Behavior Analysis for Teachers.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Overview of the principles of behavior applied to instructional management.

SPED 4040 (5040). Introduction to Education of Gifted and Talented. Lec. 3. Credit 3.

Topics to include: characteristics, incidence, identification, diagnosis, and educational needs of gifted and talented children/youth. Graduate would include but not limited to a case study of gifted person.

SPED (LIST) 4050 (5050). Sign Language I.

Lec. 3. Credit 3.

Introduction to and development of a basic vocabulary in Signed English concepts in the use of alternative methods of communication.

SPED (LIST) 4090 (5090). Sign Language II.

Lec. 3. Credit 3.

Prerequisite: SPED 4050 (5050). Continuation of vocabulary development in Signed English and appreciation of practical situations in various professional fields.

SPED 4100. Collaboration and Inclusive Practice.

Lec. 3. Credit 3.

Prerequisite: SPED 2010, SPED 3050 and full admission to the Teacher Education Program. Corequisite: Residency I. This course is designed so candidates can

gain research-based and practical knowledge of inclusion, collaboration, and co-teaching. It is designed for the special educator who will be working in resource or inclusive settings in the local education agency.

SPED 4110. Behavioral Assessment.

Lec. 3. Credit 3.

Prerequisite: Full Admission to the Teacher Education Program, SPED 3110 and SPED 3120. Focus on verbal behavior, motivating operations, and the use of functional analysis in treating common disorders.

SPED 4120. Topics in Behavior. Lec. 3. Credit 3.

Prerequisite: Full Admission to the Teacher Education Program, SPED 3110, SPED 3120 and SPED 4110. Focus on ethics in the implementation of behavior services and special uses of behavioral assessment.

SPED 4140 (5140). Curriculum Development and Education of Gifted and Talented Children/Youth.

Lec. 3. Credit 3.

Topics to include: School programs, curricula, materials, and methods for the education of gifted and talented. Graduate would include but not limited to comparing and contrasting three models in gifted education.

SPED 4170. Community Residency/Practicum I.

Credit 7.

Prerequisite: Full Admission to the Teacher Education Program, SPED 3110 and SPED 3120. Corequisite: SPED 4110. Provides an internship experience by working with persons with disabilities within the community setting by allowing the demonstration/implementation of factual knowledge and skills gained through coursework and hands-on experience. Implementing behavior intervention strategies and self-advocacy skills will show competence of this course and will be explored through weekly individual meetings with university faculty.

SPED 4180. Community Residency/Practicum II.

Credit 9.

Prerequisite: Full Admission to the Teacher Education Program and SPED 4170. Corequisite: SPED 4120. Provides an intensive internship experience by working with persons with disabilities within the community setting. Through individual mentorship of university faculty, the student will demonstrate skills necessary to implement methods in a variety of placements and the knowledge to complete mandatory state required paperwork, intensive behavior supports, and self-advocacy skills.

SPED 4200 (5200). Teaching Students with Autism Spectrum Disorders.

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education

Program. Within the context of persons with ASD, this course is designed to provide the student with a model of the teaching process progressing from identification, to instructional design, to the use of research-validated methods for instructional delivery and the provision of needed educational, social, academic, and behavioral supports.

SPED 4850 (5850). Workshop in Education.

Credit 1-6.

Laboratory approach providing opportunities for experienced education personnel to study in-depth Special Education problems.

SPED 4870. Student Teaching I. Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SPED 4880 and SPED 4890. Activities directly related to teaching performance; planning and presenting lessons, directing study, and managing the classroom. A minimum grade of B is required to meet degree requirements.

SPED 4871. Residency I. Credit 5.

Prerequisite: FOED 3810 grade B or better, full admission to the Teacher Education Program, and full admission to Residency I. Corequisite: SPED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

SPED 4872. Professional Seminar I. Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SPED 4871. Seminar for Residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

SPED 4880. Student Teaching II. Credit 5.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SPED 4870 and SPED 4890. Continuation of SPED 4870 in a different setting. A minimum grade of B is required to meet degree requirements.

SPED 4881. Residency II. Credit 10.

Prerequisite: SPED 4871 with a grade of B or better, and full admission to the Teacher Education Program. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating

with colleagues and others, effectively assessing student learning and reflecting on practice. A minimum grade of B is required to meet degree requirements.

SPED 4882. Professional Seminar II. Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SPED 4881. Seminar for Residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

SPED 4890. Seminar: Education and Society.

Credit 2.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: SPED 4870 and SPED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Study Abroad (SA)

SA 2010. ISEP Program. Credit 0.

Study at an institution abroad as part of the International Student Exchange Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

SA 2020. ISEP Program. Credit 0.

Study at an institution abroad as part of the International Student Exchange Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

SA 2110. Magellan Exchange Program. Credit 0.

Study at an institution abroad as part of the Magellan Exchange Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

SA 2120. Magellan Exchange Program. Credit 0.

Study at an institution abroad as part of the Magellan Exchange Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

SA 2210. Non-Affiliate Exchange. Credit 0.

An exchange for study abroad that is not a part of the affiliated program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange. A contract will be signed for those if Financial Aid is involved.]

SA 2220. Non-Affiliate Exchange. Credit 0.

An exchange for study abroad that is not a part of the affiliated program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange. A contract will be signed for those if Financial Aid is involved.]

SA 2310. TTU-Brazil Higher Education Consortia Program. Credit 0.

Study at a partner institution in Brazil as part of the TTU-Brazil Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

SA 2320. TTU-Brazil Higher Education Consortia Program. Credit 0.

Study at a partner institution in Brazil as part of the TTU-Brazil Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

Tennessee Consortium for International Studies (TCIS)

TCIS 2990. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 2991. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 2992. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 2993. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 4990. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 4991. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 4992. TnCIS Program. Credit 3.

Study abroad with the Tennessee Consortium for International Studies.

TCIS 4993. TnCIS Program. Credit 3.
Study abroad with the Tennessee Consortium for International Studies.

Theatre (THEA)

(O) and (E) Denote Odd and Even Years Respectively

THEA 1015. Acting I.-Fall. Lec. 3. Credit 3.
Fundamentals of the acting process examined through improvisation, characterization, text analysis, and basic acting technique.

THEA 1025. Stagecraft I.-Fall. Lec. 3. Credit 3.
An introduction to theatre technology including construction techniques, shop safety, types of scenery, scale drawing, common materials, and scene painting. Students will gain practical experience working on TTU theatre productions.

◆ **THEA 1030. Introduction to Theatre.** Lec. 3. Credit 3.
Theatre appreciation, designed to enhance the student's enjoyment of plays.

THEA 2015. Acting II.-Spring. Lec. 3. Credit 3.
Prerequisite: THEA 1015 and THEA 2155 or permission of the instructor. Continuation of the principles explored in THEA 1015 with a greater emphasis on scene work, text analysis, and character development.

THEA 2025. Stagecraft II. Lec. 3. Credit 3.
Prerequisite: THEA 1025. Advanced stagecraft continues with scenic techniques including renderings and scale models, stage lighting theory and practice, sound design, and projections. Advanced students will serve as assistants to the technical director and as crew heads for TTU theatre productions.

THEA 2110. Play Production. Lec. 1. Credit 1.
Practical experience on any phase of an English department production from playwriting to performance or committee or crew work. (Courses may be repeated for credit.)

THEA 2155. Voice and Diction. Spring (O). Lec. 3. Credit 3.
Lecture, interactive course covering basic elements of voice production and articulation.

THEA 3000. History of the Theatre. Lec. 3. Credit 3.
Representative theatrical styles from the classical through contemporary periods.

THEA 3001. Theatre Special Topics.-Spring (O). Lec. 3. Credit 3.
Coursework chosen on the basis of student interest and need. (May be taken for credit more than once if the topic is different each time.)

THEA 3200. Theatrical Design. Lec. 3. Credit 3.
Prerequisite: THEA 2200. THEA 3200 will explore the history, components, and creation of theatrical design. Students will gain a full understanding of the design process and concepts of scenic, lighting, costumes, and sound design. Lectures will provide the background knowledge, while the projects will provide the hands-on design experience.

THEA 3600. Film Studies. Lec. 3. Credit 3.
This course will focus on the film work of significant movie directors, performers, cinematographers or on a particular film genre. The student will gain a sense of the work of that director, performer, cinematographer, as well as the challenges they face putting together a film. Or, the student will get an opportunity to examine films that are significant to that particular genre. We will examine film practices, film directors, actors, cinematographers, or film genres as chosen by the instructor. The student will be responsible for watching the films in class, discussing the films and writing about the films.

THEA 4100 (5100). Advanced Acting. Lec. 3. Credit 3.
Prerequisite: THEA 2100. Advanced voice and movement study for the stage with an emphasis on period acting styles; in-depth script and character analysis; and advanced scene study.

THEA (ENGL) 4121 (5121). Shakespeare. Lec. 3. Credit 3.
Historical, thematic, and other approaches in the study of Shakespeare. (May be repeated once as an elective provided the course content is different.)

THEA 4200. Theatre Design Practicum. Lec. 3. Credit 3.
Prerequisite: THEA 1025, THEA 2025, THEA 3200. Students are assigned as scenic, lighting, sound, or costume designers for a TTU theatre production.

THEA 4300. Play Directing.-Fall (E). Lec. 3. Credit 3.
Script analysis and principles of direction. Students direct plays for public performance.

THEA 4400 (5400). Dramatic Literature.

Lec. 3. Credit 3.

Study of representative plays drawn from the classical through contemporary periods.

THEA 4500 (5500). Creative Dramatics.-Spring (E).

Lec. 3. Credit 3.

Use of an individual's dramatic imagination as a learning and teaching device.

THEA 4600. Theatre Internship. Int. 3. Credit 3.

Prerequisite: Junior/Senior Status and consent of instructor. Part time or full-time employment in a business or institution setting related to a student's academic and career goals. Cannot be taken in place of required or elective theatre courses, undergraduate or graduate. Course can be taken twice, so long as the student interns in a different business or institution for each internship.

◆ **Meets Tennessee Technological University general education requirement (Humanities/Fine Arts).**

University Business (UBUS)
UBUS 1020. Success Skills for Business Studies.

Rec. 2. Credit 1.

Connects students to the university and College of Business environments through meaningful academic and non-academic, out-of-classroom activities. Emphasizes critical thinking in the formation of academic and social goals, group participation, and in self-management and study skills.

University Music (UNMU)
UNMU 1020. First-Year Music Connection (For Music Majors Only).

Rec. 1. Credit 1.

This course engages music students in meaningful artistic, academic and non-academic out-of-classroom activities, emphasizing critical thinking in the formation of academic and artistic goals and providing essential guidance in self-management, study skills, and artistic development.

University Pre-Professional (UNPP)
UNPP 1020. University Pre-Professional, First-Year Interactions and Advisement.

Lec. 2. Act. 1. Credit 1.

This course engages the student in meaningful classroom and out-of-classroom activities. This is intended for pre-professional health science students. It emphasizes information, activities, and requirements

important to becoming competitive in a professional school application pool.

UNPP 2020. Special Topics. Lec. 1-3. Credit 1-3.

Prerequisite: Consent of Instructor. Lower Division level study in a specific topic not commonly found in a discipline on campus, not to include work experience. May be repeated if topic is different. No more than a combined total of 9 hours of special topics may be taken.

UNPP 3020. Special Topics. Lec. 1-3, Credit 1-3.

Prerequisites: Sophomore standing or above; Consent of Instructor. Upper Division level study in a specific topic not commonly found in a discipline on campus, not to include work experience. May be repeated if topic is different. No more than a combined total of 9 hours of special topics may be taken.

University Success (UNIV)
UNIV 1020. First-Year Connections.

Rec. 2. Credit 1.

Prerequisite: Freshman Standing. Engages students in meaningful academic and nonacademic, in-class and out-of-class activities. Emphasizes ethical behavior and the use of critical thinking in the formation of academic and social goals and support groups, and in self-management and study skills. Includes a creative inquiry project/activity which students should share.

UNIV 1022. Directed Studies. Credit 1.

Enhanced presentation of study skills, time management, test-taking strategies, problem solving, and in depth work in one or more content areas of difficulty.

UNIV 1030. Learning Strategies. Lec. 2. Credit 1.

UNIV 1030 is a course designed to strengthen the student's connection to Tennessee Technological University by focusing on the enhancement of skills needed for academic success. This course engages the student in meaningful academic and non-academic in-and-out-of-classroom activities. It emphasizes critical thinking in the formation of academic and social goals and support groups, in self-management, and in study strategies.

Placement in Learning Strategies (UNIV 1030) is required for students who place into two or more subject areas [Math, Reading, Writing/English] of learning support.

Students may self-place to improve their study techniques for college-level work.

UNIV 1030 may be conducted as a "Special Topics" course for students who have already completed the requirement but are required to take it as a result of being readmitted on probation or after suspension. In this capacity, the course could be taken more than once with special permission under specified circumstances.

Withdrawal is not allowed except with special permission.

UNIV 3886. Experiential Learning. Credit 6.
Work or voluntary experience that closely relates to the major, equates with skills knowledge or perspectives currently required in course work and involves analysis or reflection at lower division or upper division undergraduate credit. Portfolio evaluated by faculty team. To apply for this credit, see the following link www.tntech.edu/ISEE/CreditForLifeExperience.pdf.

UNIV 4110. PRST/LIST Internship. Lec. 3-6. Credit 3-6.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee.

Vehicle Engineering (VE)

VE 3400. Introduction to Automotive Systems. Lec. 3. Credit 3.

Prerequisite: Junior standing in engineering; consent of instructor. Introduction to a vehicle as a complex system, interactions of the subsystems in terms of overall performance. Overview of propulsion systems, suspensions and steering systems, tire-road interface, structural behavior and crash worthiness, materials and manufacturing, driver-passenger vehicle interactions, and onboard electronics.

VE 3500. Sensors, Transducers and Instrumentation. Lec. 2. Lab. 2. Credit 3.

Prerequisite: ECE 2010; PHYS 2120; consent of instructor. Introduction to sensors used in vehicles including: oxygen, tire pressure, emission, temperature, blind spot monitoring, etc. Focus on principles of measurements, theory of instruments and sensors for measuring typical physical quantities in mechanical and electrical systems. Calibration, measurement uncertainty and noise.

VE 4100. Senior Design Project I. Lec. 2. Lab. 2. Credit 3.

Prerequisite: VE 3400; senior standing in engineering; consent of instructor. Principles of vehicle engineering

design with emphasis on contemporary industrial design processes and engineering economics with applications in product design. Development phase for capstone team design project in vehicle engineering: preliminary design, supporting analyses and drawings with bill of materials.

VE 4200. Senior Design Project II. Lec. 1. Lab. 4. Credit 3.

Prerequisite: VE 3500; VE 4100; consent of instructor. Prototyping and testing phase for capstone team design project in vehicle engineering. Final design reporting (written and oral).

VE 4500. Reliability and Quality Engineering. Lec. 3. Credit 3.

Prerequisite: MATH 3470. Basic engineering and statistics principles as well as advanced tools focusing on design of experiment, statistical process control and reliability engineering are presented. Theoretical and practical methods to improve the capability of systems to perform their designated functionalities, to predict the probability of their functioning without failures in certain environments for desired periods, to assess their maintainability, availability and safety based on sampled data, and to make decisions on corrective and mitigation.

Web Design (WEBD)

WEBD 1500. Introduction to Web Design. Lec. 3. Credit 3.

This course is an introduction to the internet and its function as well as a hands-on workshop on how to build a basic webpage.

WEBD 2300. Web Site Design: Dynamic Sites. Lec. 3. Credit 3.

Prerequisite: WEBD 1500, CIW certification, evidence of having passed CIW, Exam ID0-410, or consent of the instructor. This course focuses on authoring sites, creating content, creating digital media, and effectively employing standards and technologies for effective site design.

WEBD (PC) 3500. Rhetoric and the Internet. Lec. 3. Credit 3.

Prerequisite: ENGL 1020. Instruction in web site analysis and document design, including background in rhetorical theory and principles.

WEBD (PC) 3700. Information Design in the Professions. Lec. 3. Credit 3.

Prerequisite: ENGL 3250 or PC 3250. Practical experience in the field of information design: a specialized field in which complex information is

presented clearly and efficiently to its intended audience. Students will study the design principles used to develop both print and web documents and learn about the technologies used to develop and publish such as documents.

WEBD 4950. Advanced Web Page Design.

Lec. 3. Credit 3.

Prerequisite: WEBD 2300. The development of web pages as documents using advanced tools.

WEBD 4975. Seminar in Web Design.

Lec. 3. Credit 3.

Integrative course focusing on major concepts of Web Design.

WEBD 4995. Internship in Web Design. Credit 3.

Prerequisite: WEBD 4950. Part-time employment in a professional or institutional situation related to web design. May be repeated twice for credit.

Wildlife and Fisheries Science (WFS)

WFS (BIOL) 2991. Topics.

Credit 1.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 2992. Topics.

Credit 2.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 2993. Topics.

Credit 3.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 2994. Topics.

Credit 4.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299- Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 3130. General Ecology.

Lec. 3. Lab. 3. Credit 4.

The relationship between plants and animals and their environment. The laboratory provides examples of concepts discussed in lecture and analytical procedures used in interpreting data.

WFS (CJ) 3500. Wildlife Law Enforcement.

Lec. 3. Credit 3.

State wildlife laws and practices used in their enforcement.

WFS (BIOL) 4220 (5220). Biostatistics.

Lec. 3. Credit 3.

Probability and frequency distribution; statistical populations and samples; and tests of hypotheses used in biological research.

WFS (BIOL) 4230 (5230). Animal Behavior.

Lec. 3. Credit 3.

Prerequisite: Junior Standing. Introduction to basic principles underlying the behavior of animals.

WFS 4500 (5500). National Wildlife Policy.

Lec. 3. Credit 3.

Prerequisite: Eight semester hours of Biology. Policies, agencies and laws that influence wildlife management on a national level.

WFS (BIOL) 4630 (5630). Ornithology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. General survey of the class Aves with emphasis on morphology, identification and ecology of local birds.

WFS 4640 (5640). Waterfowl Ecology and Management.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 3130 or WFS 3130. Advanced ecological principles as illustrated by ducks, geese, and swans, including habitat selection, morphological and behavioral adaptations, intraspecific and interspecific interactions, and reproductive ecology. Field techniques for identifying species and management approaches are emphasized in the laboratory.

WFS (BIOL) 4650 (5650). Marine Biology.

Lec. 3. Lab. 2. Credit 4.

Prerequisite: BIOL 3130 or WFS 3130. An introduction to the study of the marine environment and marine organisms.

WFS 4660 (5660). Wild Bird Ecology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 3130 or WFS 3130 or concurrent enrollment. The ecology and natural history of selected avian species, emphasizing game species, endangered species, predators, and pests. Anatomy and procedures for identification are the focus of laboratories.

WFS 4670 (5670). Wild Mammal Ecology.

Lec. 2. Lab. 2. Credit 3.

Prerequisite: BIOL 3130 or WFS 3130 or concurrent enrollment. The natural history and ecology of selected mammal species, emphasizing game species, furbearers, endangered species, predators, and pests. Anatomy and procedures for identification are the focus of the laboratories.

WFS 4700 (5700). Habitat Management.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: BIOL 3240. Description, principles and techniques of quantitative characterization of wildlife habitat types.

WFS 4710 (5710). Fisheries Management.

Lec. 3. Lab. 3. Credit 4.

Prerequisite: BIOL 3130 or WFS 3130. Theory, methods, and techniques of freshwater fisheries management. Field and laboratory.

WFS 4711 (5711). Fisheries Management.

Lec. 3. Credit 3.

Prerequisite: BIOL 3130 or WFS 3130. Classroom-based overview of theory, methods, and techniques of freshwater fisheries management.

WFS 4730 (5730). Conservation Biology.

Lec. 3. Credit 3.

Prerequisite: BIOL 3130 or WFS 3130. Advanced concepts of plant and animal conservation, including biodiversity, population genetics, habitat fragmentation, endangered and threatened species, and ecosystem management.

WFS 4740 (5740). Wildlife Principles.

Lec. 2. Credit 2.

Prerequisite: BIOL 3130 or WFS 3130. Classroom-based theory and principles of wildlife management.

WFS 4760 (5760). Fish Culture.

Lec. 2. Lab. 4. Credit 4.

Prerequisite: BIOL 3130 or WFS 3130. Cultural

practices; hatchery operation, care of brood fish, transport and stocking; and the ecological requirements of hatchery species.

WFS 4770 (5770). Nongame Species Management.

Lec. 3. Credit 3.

Prerequisite: Junior Standing. Advanced concepts of managing non-game species. Topics include urban wildlife, funding mechanisms, monitoring and inventory techniques, habitat management, rare species, and state wildlife action plans.

WFS 4790. Wildlife Techniques.-Summer.

Lec. 2. Lab. 12. Credit 6.

Prerequisite: WFS 4740 (5740). Field-based techniques for studying and managing wildlife populations.

WFS 4800. Conservation Techniques.--Summer.

Lec. 1. Lab. 6. Credit 3.

Prerequisite: BIOL 3120 or BIOL/WFS 3130. Field-based techniques used by conservation biologists to study and manage fish and wildlife populations.

WFS (BIOL) 4810 (5810). Ichthyology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Identification, classification, anatomy, physiology, ecology and adaptations of fishes; emphasis on North American freshwater species.

WFS (BIOL) 4820 (5820). Mammalogy.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Classification, structure and function, phylogeny and geographical distribution of mammals; emphasis on Tennessee mammals.

WFS (BIOL) 4830 (5830). Herpetology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Classification, adaptations, habits, life histories and geographical distribution of amphibians and reptiles; emphasis on North American species.

WFS (BIOL) 4840 (5840). Limnology.

Lec. 2. Lab. 3. Credit 3.

Prerequisite: Junior Standing. Physiochemical and biological dynamics of inland waters.

WFS 4870 (5870). GIS for Wildlife and Fisheries.

Lec. 2. Lab 3. Credit 3.

Prerequisite: Junior Standing. Introduction to Geographic Information Systems (GIS) using both raster and vector spatial data models, with hands on experience utilizing computers to aid problem solving in Wildlife and Fisheries Science.

WFS 4900. Internship in Wildlife and Fisheries Science.

Credit 3.

Prerequisite: Consent of instructor required. Students work with a public agency that is compatible with their interests. (May be taken twice if the assignments are with different agencies or different divisions within an agency.)

WFS (BIOL) 4991 (5991). Advanced Topics.

Credit 1.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 4992 (5992). Advanced Topics.

Credit 2.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 4993 (5993). Advanced Topics.

Credit 3.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

WFS (BIOL) 4994 (5994). Advanced Topics.

Credit 4.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599-) Advanced Topics courses are earned.

Women and Gender Studies (WGS)

◆WGS 2010. Introduction to Women and Gender Studies.

Lec. 3. Credit 3.

Examination of issues in women and gender studies from a social sciences perspective. This course is a requirement for the Women and Gender Studies minor.

◆ Meets Tennessee Technological University general education requirement (Social/Behavioral Sciences).

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Brenda Wilson, Communication
Jerry Gannod, Computer Science
Barry Stein, Counseling & Psychology
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Commission on the Status of Blacks
Commission on the Status of Women
Committee on Commencements, Convocations, and Academic Ceremonies
Curriculum Committee
Faculty and Staff Traffic Appeals Committee
Faculty Research Committee
Graduate School Executive Committee
Information Technology Committee
Institutional Animal Care and Use Committee
Institutional Review for the Protection of Human Subjects
Intellectual Property Advisory Committee
International Affairs Committee
Military Affairs Advisory Committee
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Outstanding Faculty Awards Committee
Outstanding Professional Awards Committee
Sports Hall of Fame Committee
Staff Advisory Committee to the President
Stormwater Management Committee
Student Affairs Committee
Student Financial Aid Committee
Teacher Education Committee
University Art Committee
University Assembly
University Judicial Council
University Research Advisory Committee
University Safety and Environmental Committee
University Strategic Planning and Assessment Committee

UNIVERSITY COMMITTEES

(The President is a member, ex-officio, of all committees. The Academic Council and the Administrative Council meeting in joint session constitute the University Assembly for Tennessee Technological University).

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Administrative Council

Admissions and Credits Committee

Americans with Disabilities Act (ADA) Advisory Committee

Athletics Committee

Budget Advisory Committee

Buildings and Grounds Committee

Campus Recreation Advisory Committee

Campus Space Utilization and Allocation Committee

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